Vol. 1019 Number 5

# OFFICIAL GAZETTE

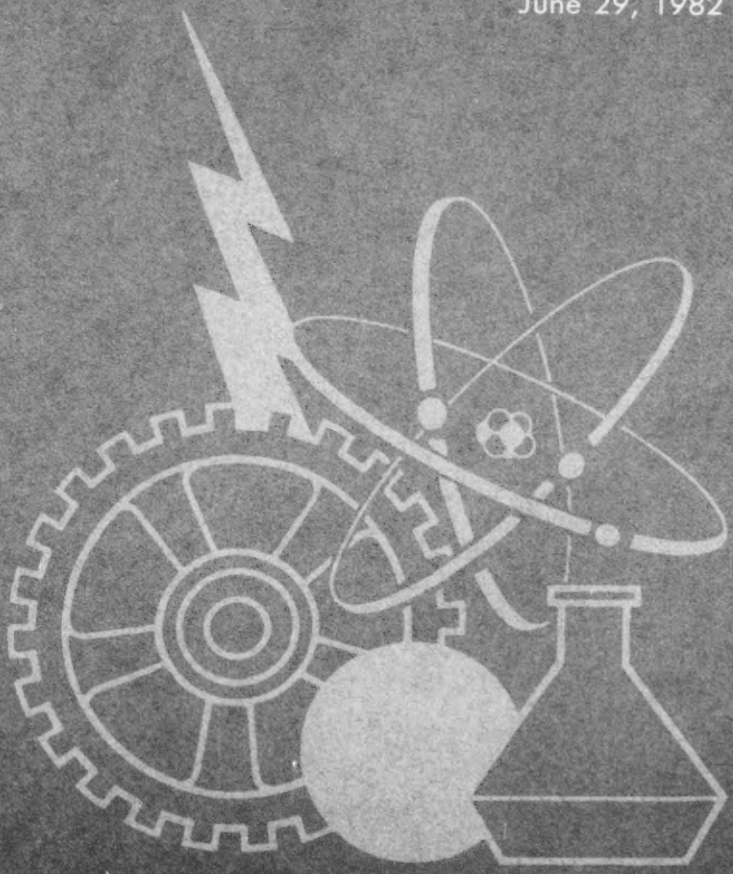
of the

## UNITED STATES PATENT AND TRADEMARK OFFICE

Route to:

PATENTS

June 29, 1982



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# OFFICIAL GAZETTE of the UNITED STATES PATENT and TRADEMARK OFFICE

June 29, 1982 Volume 1019 Number 5


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# PATENT AND TRADEMARK OFFICE NOTICES

### Patent Cooperation Treaty Information

For information concerning the PCT member countries and the most recent PCT rule changes see the notices appearing in the Official Gazette at 1001 O.G. 14 on Dec. 9, 1980 and at 1012 O.G. 20 on Nov. 17, 1981.

Note that the international fees have been increased as of Jan. 1, 1982. The current schedule of fees is as follows:

| | |
|---|---|
| Transmittal fee | $ 35.00 |
| Search fee | 300.00 |
| International Fees | |
| Basic Fee (first 30 pages) | 270.00 |
| Basic Supplemental Fee (for each sheet over 30) | 6.00 |
| Designation Fees | 65.00 |

GERALD J. MOSSINGHOFF,
Jan. 19, 1982. *Commissioner of Patents and Trademarks.*

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### Board of Appeals Decisions Rendered in the Month of May 1982

| | |
|---|---|
| Affirmed | 203 |
| Affirmed in Part | 20 |
| Reversed | 77 |
| Total | 300 |

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### REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

**D. 260,218,** Re. S.N. 364,583, Filed Apr. 1, 1982, Cl. 6/253, COMBINED SKIRT AND TROUSER HANGER, Leonard Bisk, Owner of Record: *Inventor,* Attorney or Agent: A.D. Caesar, et al., Ex. Gp.: 290

**3,563,286,** Re. S.N. 372,191, Filed Apr. 26, 1982, Cl. 83/855, SAW, Keene S. Strobel, et al., Owner of Record: *Weyerhaeuser Co., Tacoma, Wash.,* Attorney or Agent: Gordon D. Schmidt, et al., Ex. Gp.: 323

**3,888,674,** Re. S.N. 352,690, Filed Feb. 25, 1982, Cl. 430,311, AUTOMATIC SLICE PROCESSING, James R. Moreland, et al., Owner of Record: *Texas Instruments, Inc., Dallas, Tex.,* Attorney or Agent: Thomas W. DeMond, Ex. Gp.: 166

**4,062,278,** Re. S.N. 374,621, Filed May 3, 1982, Cl. 100/4, EXPANDING STRAP LOOP FORMING AND FRICTION FUSION MACHINE, Nelson Cheung, Owner of Record: *Signode Corp., Glenview, Ill.,* Attorney or Agent: Max Dressler, et al., Ex. Gp.: 242

**4,067,286,** Re. S.N. 374,663, Filed May 4, 1982, Cl. 114/283, HYDRO-SKI CRAFT WITH LONGITUDINAL FLAPS, Ernest G. Stout, et al., Owner of Record: *Lockheed Aircraft Corp., Burbank, Calif.,* Attorney or Agent: John M. May, Ex. Gp.: 315

**4,162,992,** Re. S.N. 373,066, Filed Apr. 29, 1982, Cl. 252/456, OXIDATION AND AMMOXIDATION CATALYSTS, Kenneth W. Wise, Owner of Record: *Monsanto Co., St. Louis, Mo.,* Attorney or Agent: A. Milton Cornwell, Ex. Gp.: 116

**4,165,542,** Re. S.N. 376,689, Filed May 10, 1982, Cl. 2/209.1, HEAD COVERING, Rita E. McLaughlin, Owner of Record: *Inventor,* Attorney or Agent: Robert J. Schiller, et al., Ex. Gp.: 353

**4,186,283,** Re. S.N. 344,228, Filed Jan. 28, 1982, Cl. 179/175.3R, TEST SET, James F. Simmons, Owner of Record: *Perkins Research & Manufacturing Co., Inc., Canoga Park, Calif.,* Attorney or Agent: Donald A. Streck, Ex. Gp.: 234

**4,187,173,** Re. S.N. 346,364, Filed Feb. 5, 1982, Cl. 210/655, REVERSE OSMOSIS METHOD AND APPARATUS, Bowie G. Keefer, Owner of Record: *Seagold Industries Corp., Burnaby, British Columbia, Canada,* Attorney or Agent: Daniel R. Bereskin, Ex. Gp.: 176

**4,197,833,** Re. S.N. 340,601, Filed Jan. 19, 1982, Cl. 126/432, SOLAR COLLECTOR SYSTEM USING SLATE ABSORBER PANELS, James D. Pelish, Owner of Record: *Inventor,* Attorney or Agent: S. Delvalle Goldsmith, et al., Ex. Gp.: 345

**4,201,953,** Re. S.N. 372,221, Filed Apr. 26, 1982, Cl. 331/94.5PL, LASER SYSTEM WITH TRIANGULATED CAPACITOR ENCIRCLING THE LASER HEAD, Gene Allen Robbins, Owner of Record: *Inventor,* Attorney or Agent: None, Ex. Gp.: 254

**4,226,897,** Re. S.N. 355,202, Filed Mar. 5, 1982, Cl. 427/39, METHOD OF FORMING SEMICONDUCTING MATERIALS AND BARRIERS, John Howard Coleman, Owner of Record: *Inventor,* Attorney or Agent: None, Ex. Gp.: 162

**4,247,773,** Re. S.N. 374,327, Filed May 3, 1982, Cl. 250/339, METHOD FOR QUANTITATIVELY DETERMINING FAT IN A FAT-CONTAINING SAMPLE, Sten A. Nexo, et al., Owner of Record: *Foss America, Inc., Fishkill, N.Y.,* Attorney or Agent: Richard R. Treler, et al., Ex. Gp.: 256

**4,249,229,** Re. S.N. 376,638, Filed May 10, 1982, Cl. 361,399, TRANSFORMER HAVING NOVEL MULTIPLE WINDING AND SUPPORT STRUCTURE AND METHOD OF MAKING SAME, Thomas E. Hester, Owner of Record: *Litton Systems, Inc., Huntington, Ind.,* Attorney or Agent: Robert H. Lentz, et al., Ex. Gp.: 217

**4,262,448,** Re. S.N. 352,878, Filed Feb. 26, 1982, Cl. 49/367, SAFETY STORAGE CABINET, Frank S. Flider, Owner of Record: *Justrite Manufacturing Co., Mattoon, Ill.,* Attorney or Agent: Irwin C. Alter, Ex. Gp.: 352

**4,266,206,** Re. S.N. 375,433, Filed May 5, 1982, Cl. 333/204, STRIPLINE FILTER DEVICE, Brian E. Bedard, et al., Owner of Record: *Motorola, Inc., Schaumburg, Ill.,* Attorney or Agent: James W. Gillman, et al., Ex. Gp.: 256

**4,304,766,** Re. S.N. 375,888, Filed May, 7, 1982, Cl. 424/52, COMPOSITIONS FOR REDUCING ELUTION OF THERAPEUTIC AGENTS FROM TEETH, Robert W.H. Chang, Owner of Record: *Inventor,* Attorney or Agent: Cruzan Alexander, et al., Ex. Gp.: 125

**4,308,393,** Re. S.N. 367,756, Filed Apr. 12, 1982, Cl. 556/445, FLUORINE CONTAINING ORGANOSILICON COMPOUNDS, David Apotheker, Owner of Record: *E.I. DuPont de Nemours & Co., Wilmington, Del.,* Attorney or Agent: Paul R. Steyermark, Ex. Gp.: 117

**4,309,096,** Re. S.N. 372,851, Filed Apr. 28, 1982, Cl. 354/021, FILM CARTRIDGE ASSEMBLY WITH PRESSURE PLATE, Gurdip S. Sethi, Owner of Rec-

ord: *Eastman Kodak Co., Rochester, N.Y.*, Attorney or Agent: James A. Smith, et al., Ex. Gp.: 211

**4,317,205,** Re. S.N. 371,605, Filed Apr. 26, 1982, Cl. 375/7, WIDEBAND TRANSCEIVER WITH EMI SUPPRESSION, Tat C. Lam, Owner of Record: *TCL., Inc., Santa Clara, Calif.*, Attorney or Agent: Karl A. Limbach, et al., Ex. Gp.: 233

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**REQUESTS FOR REEXAMINATION FILED**

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.21(b)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b).

**Re. 28,474,** Reexam. No. 90/000,213, Requested: June 3, 1982, Cl. 523/336, PROCESS FOR RAPIDLY DISSOLVING WATER-SOLUBLE POLYMERS, Donald R. Anderson, et al., Owner of Record: *Nalco Chemical Co., Oak Brook, Ill.*, Attorney or Agent: Hume, Clement, Brinks, Williams, Olds & Cook, Ex. Gp.: 140, Requester: Lawrence Rosen, New York, N.Y.

**Re. 29,694,** Reexam. No. 90/000,209, Requested: June 1, 1982, Cl. 29/36, TOOL SUPPORT FOR USE IN MACHINE TOOLS PARTICULARLY IN TURNING MACHINES, Gerhard Foll, et al., Owner of Record: *Index-Werke KG, Hahn & Tessky, Esslingen/Necker, Germany*, Attorney or Agent: Theodore W. Anderson, Ex. Gp.: 320, Requester: Giddings & Lewis, Inc., Fond du Lac, Wis.

**3,476,438,** Reexam. No. 90/000,207, Requested: May 28, 1982, Cl. 229/86, CUTTER BIT, Arnold B. Bower, Jr., Owner of Record: *Hughes Tool Co., Houston, Tex.*, Attorney or Agent: Harold J. Holt, Ex. Gp.: 240, Requester: Robert E. Walter, PMG Pat. Dept., GTE Service Corp., Danvers, Mass.

**3,671,726,** Reexam. No. 90/000,205, Requested: May 25, 1982, Cl. 364/563, ELECTRO-OPTICAL APPARATUS FOR PRECISE ON-LINE MEASUREMENT OF THE THICKNESS OF MOVING STRIP MATERIAL, James R. Kerr, Owner of Record: *Morvue, Inc., Tigard, Oreg.*, Attorney or Agent: Daniel P. Chernoff, Ex. Gp.: 230, Requester: Trienco, Inc., Montrose, Colo.

**3,720,760,** Reexam. No. 90/000,199, Requested: May 14, 1982, Cl. 424/1, METHOD FOR DETERMINING THE PRESENCE OF REAGIN-IMMUNOGLOBULINS (REAGIN-IG) DIRECTED AGAINST CERTAIN ALLERGENS, IN AQUEOUS SAMPLES, Hans H. Bennich, et al., Owner of Record: *Pharmacia, Inc., Piscataway, N.J.*, Attorney or Agent: Fred C. Philpitt, Ex. Gp.: 220, Requester: Ventrex Labs., Inc., Portland, Me.

**3,874,852,** Reexam. No. 90/000,211, Requested: June 1, 1982, Cl. 23/230, REAGENT AND METHOD FOR DETERMINING LEUKOCYTES AND HEMOGLOBIN IN THE BLOOD, Thomas E. Hamill, Owner of Record: *Coulter Diagnostics, Inc., Hialeah, Fla.*, Attorney or Agent: Silvermann & Cass, Ex. Gp.: 170, Requester: John L. White, Millen & White, P.C., Arlington, Va.

**4,123,415,** Reexam. No. 90/000,203, Requested: May 24, 1982, Cl. 116/28.1, REINFORCED THERMOPLASTIC POLYESTER COMPOSITIONS HAVING IMPROVED RESISTANCE TO HEAT DEFLECTION, Allen D. Wambach, Owner of Record: *General Electric Co., Pittsfield, Mass.*, Attorney or Agent: Edward A. Hedman, Ex. Gp.: 240, Requester: Aron Preis, Mobay Chemical, Corp., Pittsburgh, Pa.

**4,154,382,** Reexam. No. 90/000,206, Requested: May 27, 1982, Cl. 224/39, BICYCLE RACK, James R. Blackburn, Owner of Record: *Inventor*, Attorney or Agent: Claude A.S. Hamrick, et al., Ex. Gp.: 241, Requester: James R. Blackburn, c/o Claude A.S. Hamrick, Santa Clara, Calif.

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**Patents Available for License or Sale**

3,961,386. TOILET SEAT COVER APPARATUS. *Ferdinand Beno,* 820 S. Park Ter., Suite 204, Chicago, Ill. 60605, (312) 786-9349.

3,698,594. DISPOSABLE FEEDING DISH AND ITS COMPLEMENTARY RECEPTACLE. *Marjorie A. Boehlert,* 2320 Great Falls St., Falls Church, Va. 22046.

3,844,037. CABLE CUTTER, *Carl F. Geller,* Luner Damn 17 3140 Luneburg, Federal Republic of Germany. Correspondence to: Michael J. Striker, 360 Lexington Ave., New York, N.Y. 10017.

4,081,798. LET-BALL DETECTORS. *Lowell S. Pelfrey,* 1773 Pine Ave., Long Beach, Calif. 90813.

4,136,764. MOTHER ALICE'S BREAD VENDING MACHINE. *Alice Johnson,* 8650 Belford Ave. #I Los Angeles, Calif. 90045. 213-645-4476.

4,279,396. SHOWER CURTAIN CLIP. *E.M. Bendock,* 35 South Franklin Ave., Lynbrook, N.Y. 11563.

4,293,152. FLEXIBLE PIPE-CONNECTIN FITTING. *Hans Berghofer,* Alte Landstrasse 274,2000 Hamburg, 65, Federal Republic of Germany. Correspondence to: Michael J. Striker, 360 Lexington Ave., New York, N.Y. 10017.

4,291,922. ANTI-SKID MECHANISM FOR WHELLED VEHICLE. *Andrew E. Piece,* 28729 Bannockburn, Farmington Hills, Mich. 48018.

4,299,268. AUTOMATICALLY CONTROLLED CASTING PLANT. *James A. Oliff, Stevens, Davis, Miller & Mosher,* 1911 Jefferson Davis Hwy., Suite 600, Crystal Mall 1, Arlington, Va., 22202. 703-920-8900.

4,302,180. FUEL BURNER. *Neil F. Greenblum, Sandler & Greenblum,* 701 South 23rd St., Arlington, Va. 22202. (703) 521-7800.

The following two patents are offered by Elmer R. Hagen, Royal Arms Apt. #3, 230 W. Genesee St., Auburn, N.Y. 13021.

3,790,043. METHOD AND APPARATUS FOR REMOVING WRINKLES FROM SLACKS OR THE LIKE.

3,893,706. CHILDRENS' RIDING TOY.

The following two patents are offered by Lester G. Peters, General Delivery, Bartlett, N.H. 03812.

4,204,467. DE-STONING AND SIMULTANEOUSLY FILING A DRUPE.

3,987,948. APPARATUS FOR OPENING DRUPACEOUS FRUT.

The following two patents are offered by: Techni Research Associates, Inc., 41 Easton Rd., Willow Grove, Pa. 19090.

4,161,409. CORROSION INHIBITIVE PIGMENT.

4,205,929. SLURRY TRANSPORT MEDIUM.

The following patents are offered by Barry G. Magidoff, 521 Fifth Ave., New York, N.Y. 10175, (212) 697-0875.

3,773,635. PROCESSING OF MANGANESE NODULES FROM THE OCEAN FLOOR FOR METAL VALUES.

3,752,745. RECOVERY OF METAL VALUES FROM OCEAN FLOOR NODULES.

3,950,486. METHOD FOR SEPARATING METAL CONSTITUENTS FROM OCEAN FLOOR NODULES.

4,042,664. METHOD FOR SEPARATING METAL CONSTITUENTS FROM OCEAN FLOOR NODULES.

4,903,236. METHOD FOR OBTAINING METAL VALUES BY THE HALIDATION OF A BASIC MANGANIFEROUS ORE WITH FERRIC CHLORIDE PRETRETMENT.

The RCA Corp. offers to grant non-exclusive licenses on reasonable terms and conditions under the patents listed below. Inquiries respecting licenses under RCA patents should be addressed to RCA Corp., Sr. Vice President, Licensing, 30 Rockefeller Plz., New York, N.Y. 10020.

4,323,755. METHOD OF MAKING A MACHINE-READABLE MARKING IN A WORKPIECE.

4,323,789. SEQUENCER FOR POWER SUPPLY VOLTAGES.

4,323,813. SPRING-LOADED RESISTIVE LENS STRUCTURE FOR ELECTRON GUN.

4,323,814. MESH ASSEMBLY HAVING REDUCED MICROPHONICS FOR A PICK-UP TUBE.

4,323,815. UNITARY BEAM GUIDE/ELECTRON GUN ASSEMBLY FOR FLAT PANEL DISPLAY DEVICES.

4,323,816. SYSTEM FOR ENHANCING DEFLECTION IN KINESCOPES.

4,323,910. MNOS MEMORY TRANSISTOR.

4,323,916. DATA RATE REDUCTION FOR DIGITAL VIDEO SIGNALS BY SUBSAMPLING AND ADAPTIVE RECONSTRUCTION.

4,323,918. OPTICAL ASSEMBLY FOR COLOR TELEVISION.

4,323,963. HARDWARE INTERPRETIVE MODE MICROPROCESSOR.

4,323,998. VIDEO DISC LOCKED GROOVE CORRECTOR.

4,324,132. APPARATUS AND METHOD FOR MEASURING THE RATE OF EVAPORATION OF A LIQUID.

4,324,814. METHOD FOR FORMING A NARROW THIN FILM LINE.

4,325,017. TEMPERATURE-CORRECTION NETWORK FOR EXTRAPOLATED BAND-GAP VOLTAGE REFERENCE CIRCUIT.

4,325,018. TEMPERATURE-CORRECTION NETWORK WITH MULTIPLE CORRECTIONS AS FOR EXTRAPOLATED BAND-GAP VOLTAGE REFERENCE CIRCUITS.

4,325,021. REGULATED SWITCHING APPARATUS.

4,325,040. APPARATUS FOR AUTOMATIC ADJUSTMENT OF AN INDUCTOR IN A TUNED CIRCUIT.

4,325,076. ELECTRONIC FILTER FOR GENERATING A THIRD HARMONIC SIGNAL.

4,325,134. VIDEO DISC DEFECT DETECTOR.

4,325,136. VIDEO DISC PLAYER HAVING CARRIAGE DRIVE APPARATUS.

4,325,419. APPARATUS FOR TRANSFERRING PURE ABRASIVE MATERIAL FROM ONE HOPPER TO ANOTHER.

4,325,489. ENVELOPE FOR FLAT PANEL DISPLAY DEVICES.

4,326,151. SCANNING WAVEFORM GENERATOR FOR FLAT PANEL DISPLAY DEVICES.

4,326,284. VIDEO DISC PLAYER HAVING TURNTABLE ASSIST APPARATUS.

4,326,325. METHOD AND APPARATUS FOR DEFLASHING MOLDED RECORDED DISCS.

4,326,494. WAFER AND BOULE PROTECTION DURING THE BLADE RETURN STROKE OF A WAFER SAW.

4,326,553. MEGASONIC JET CLEANER APPARATUS.

4,320,490. VIDEO DISC CARTRIDGE HAVING A SELF RETAINING ELECTRODE.

4,320,491. APPARATUS FOR VIDEO DISC STYLUS ELECTRODE RECONDITIONING.

4,320,503. SYNCHRONIZING TRANSMISSIONS FROM TWO EARTH STATIONS TO SATELLITE.

4,320,567. OPTICAL INSPECTION METHOD FOR DETERMINING MACHINABILITY.

4,321,470. ELECTRON FLOOD EXPOSURE APPARATUS.

4,321,491. LEVEL SHIFT CIRCUIT.

4,321,492. TWO INPUT SENSE CIRCUIT.

4,321,511. LINEARITY CORRECTED DEFLECTION CIRCUIT.

4,321,513. TELEVISION RECEIVER HIGH VOLTAGE PROTECTION CIRCUIT.

4,321,514. COMMUTATED SCR REGULATOR FOR A HORIZONTAL DEFLECTION CIRCUIT.

4,321,543. THREE-CONDITION DISPLAY SYSTEM.

4,321,602. FREQUENCY-TRACKING FILTER, AS FOR USE IN FM-CW RADAR.

4,321,624. AFT CIRCUIT.

4,321,648. OVER-CURRENT PROTECTION CIRCUITS FOR POWER TRANSISTORS.

4,321,702. CARRIAGE RESET APPARATUS FOR DISC RECORD PLAYER.

4,321,772. LEVELABLE LAPPING MACHINE.

4,322,253. METHOD OF MAKING SELECTIVE CRYSTALLINE SILICON REGIONS CONTAINING ENTRAPPED HYDROGEN BY LASER TREATMENT.

4,322,277. STEP MASK FOR SUBSTRATE SPUTTERING.

4,322,592. SUSCEPTOR FOR HEATING SEMICONDUCTOR SUBSTRATES.

4,322,599. APPARATUS FOR RESISTANCE WELDING OF AN ELECTRO-OPTIC DEVICE HOUSING.

4,322,643. DIGITAL PHASE COMPARATOR WITH IMPROVED SENSITIVITY FOR SMALL PHASE DIFFERENCES.

4,322,691. CIRCUITRY FOR GENERATING ELECTRIC SIGNALS WITH PROPORTIONAL OPPOSITE-SENSE RATES OF CHANGE.

4,322,747. RAPID SYNCHRONIZATION OF INFORMATION ON SEPARATE RECORDED MEDIUMS.

4,322,770. LATCH-UP PREVENTION CIRCUIT FOR POWER OUTPUT DEVICES USING INDUCTIVE LOADS.

4,317,427. CARRIER FOR ROTATABLY HOLDING KINESCOPE FACEPLATE DURING PROCESSING.

4,317,844. SEMICONDUCTOR DEVICE HAVING A BODY OF AMORPHOUS SILICON AND METHOD OF MAKING THE SAME.

4,318,015. LEVEL SHIFT CIRCUIT.

4,318,026. METHOD OF MAKING A GRID FOR A CATHODE-RAY TUBE ELECTRON GUN.

4,318,027. HIGH POTENTIAL, LOW MAGNIFICATION ELECTRON GUN.

4,318,035. SIDE PINCUSHION CORRECTION CIRCUIT.

4,318,045. SYMMETRICAL WAVEFORM SIGNAL GENERATOR HAVING COHERENT FREQUENCY SHIFT CAPABILITY.

4,318,051. SYMMETRICALLY GAIN CONTROLLED DIFFERENTIAL AMPLIFIER.

4,318,087. SWITCH CLOSURE SENSING CIRCUIT.

4,318,120. COLOR TV BURIED SUBCARRIER SYSTEM.

4,318,123. SOLID-STATE, COLOR-ENCODING TELEVISION CAMERA.

4,318,216. EXTENDED DRAIN SELF-ALIGNED SILICON GATE MOSFET.

4,318,749. WETTABLE CARRIER IN GAS DRYING SYSTEM FOR WAFERS.

4,318,877. VIDEO DISC MOLDING PROCESS.

4,319,163. ELECTRON GUN WITH DEFLECTION-SYNCHRONIZED ASTIGMATIC SCREEN GRID MEANS.

4,319,167. HIGH FREQUENCY FERRORESONANT POWER SUPPLY FOR A DEFLECTION AND HIGH VOLTAGE CIRCUIT.

4,319,187. METHOD FOR MEASURING THE DRIFT MOBILITY IN DOPED SEMICONDUCTORS.

4,319,245. DOPPLER SIGNAL PROCESSING APPARATUS.

4,319,273. TELEVISION SIGNAL WITH ENCODED SYNCHRONIZING SIGNALS.

4,319,277. INSTITUTIONAL AUDIO-VISUAL SYSTEM INCLUDING A PLURAL OPERATING MODE TELEVISION RECEIVER.

4,319,284. REPETITIVE READOUT OF ELECTROSTATICALLY STORED INFORMATION.

4,319,359. RADIO TRANSMITTER ENERGY RECOVERY SYSTEM.

4,319,954. METHOD OF FORMING POLYCRYSTALLINE SILICON LINES AND VIAS ON A SILICON SUBSTRATE.

4,320,373. POWER TRANSFORMER WITH HIGH COUPLING COEFFICIENT.

4,320,416. TECHNIQUE FOR OPTIMALLY ENCODING DIGITALLY ENCODED VIDEO SIGNALS.

4,320,487. VIDEO DISC STYLUS CONTROL APPARATUS.

4,320,489. REVERSIBLE OPTICAL STORAGE MEDIUM AND A METHOD FOR RECORDING INFORMATION THEREIN.

4,327,047. METHOD FOR PRODUCING DISC RECORDS HAVING MOLDED-IN CENTER HOLES.

4,327,048. HIGH DENSITY INFORMATION DISC PROCESSING.

4,327,123. METHOD OF METALLIZING A PHOSPHOR SCREEN.

4,327,140. HIGH DENSITY INFORMATION DISC LUBRICANTS.

4,327,283. WORKPIECE WITH MACHINE-READABLE MARKING RECESSED THEREIN AND METHOD OF MAKING SAME.

4,327,325. CHUCK FOR USE IN TESTING OF SEMICONDUCTOR PELLETS.

4,327,332. CIRCUIT ARRANGEMENT USEFUL IN DEVELOPING DECOUPLED OPERATING VOLTAGES FOR IF AMPLIFIER STAGES OF AN INTEGRATED CIRCUIT.

4,327,370. RESILIENT CONTACT RING FOR PROVIDING A LOW IMPEDANCE CONNECTION TO THE BASE REGION OF A SEMICONDUCTOR DEVICE.

4,327,376 DUAL PHASE-CONTROL LOOP HORIZONTAL DEFLECTION SYNCHRONIZING CIRCUIT.

4,327,431. VIDEO DISC PLAYER WITH VARIABLE OFFSET RFI REDUCTION CIRCUIT.

4,327,432. VIDEO DISC PLAYER WITH RFI REDUCTION CIRCUIT.

4,327,434. VIDEO DISC STYLUS POSITION SENSOR SYSTEM.

The General Electric Co. is prepared to grant non-exclusive license under the following patents upon reasonable terms to domestic manufactureres.

Applications for license may be addressed to Patent Counsel, Medical Systems Division, General Electric Co., P.O. Box 414, Milwaukee, Wisc. 53201.

4,262,182. FULLY ILLUMINATED BACKLIT MEMBRANE TOUCH SWITCH.

Application for license may be addressed to: Group Patent Counsel, Lighting Business Group, General Electric Co., Nela Park, Cleveland, Ohio 44112.

4,186,433. LUMINAIRE.

Applications for licences may be addressed to: Division Patent Counsel, Housewares & Audio Business Division-21BW, General Electric Co., 1285 Boston Ave., Bridgeport, Conn. 06602.

3,275,919. RECHARGER CONTACTS FOR ELECTRIC TOOTHBRUSH. Patented on Sept. 27, 1965 on an application by George A. Decker and Daniels B. Fisk.

3,308,498. BATTERY-POWERED CLOTHES BRUSH. Patented on Mar. 14, 1967 on an application by R.M. Evans, Jr.

3,316,577. BATTERY-POWERED CLOTHES BRUSH. Patented on May 2, 1967 on an application by J. Kravos.

3,319,350. HAIR CURL DRYING APPARATUS. Patented on May 16, 1967 on an application by Simon Hlubik.

3,358,383. HAIR DRYER BONNET COMPRISING AN INFLATABLE ANNULAR AIR CUSHION. Patented on Dec. 19, 1967 on an application by Gerald H. Snider.

3,362.086. HAIR DRYER WITH SELECTIVE TELESCOPIC ADJUSTING MEANS. Patented on Jan. 2, 1968 on an application by James O. McLean.

3,418,552. SEPARABLE TRANSFORMER BATTERY CHARGER. Patented on Dec. 24, 1968 on an application by Robert G. Holmes.

3,420,250. ELECTRIC MANICURIST POWER HANDLE. Patented on Jan. 7, 1969 on an application by Robert G. Holmes.

3,431,611. METHOD FOR FORMING NONWOVEN ELECTRIC BLANKET SHELLS. Patented on Mar. 11, 1969 on an application by John C. Rentz.

3,461,859. HAND OPERATED VIBRATOR. Patented on Aug. 19, 1969 on an application by George A. Fortnam.

3,474,794. HEAD SUPPORTING AND SEALING MEANS FOR HAIR TREATING APPARATUS. Patented on Oct. 28, 1969 on an application by Thomas F. Nelson.

3,510,747. TWO PART SEPARABLE BATTERY CHARGER. Patented on May 5, 1970 on an application by Christie Petrides.

3,536,032. WATER LEVEL INDICATOR. Patented on Oct. 27, 1970 on an application by Thomas W. Ridding.

3,550,285. HAIR DRYER APPARATUS. Patented on Dec. 29, 1970 on an application by William A. Omohundro.

3,588,444. HAIR TREATING APPARATUS. Patented on June 28, 1971 on an application by William A. Omohundro.

3,610,589. HUMIDIFIER. Patented on Oct. 5, 1971 on an application by William P. Paulin.

3,702,031. HAIR DRYER HOOD TILT MECHANISM. Patented on Nov. 7, 1972 on an application by William D. Rychman, Jr.

3,777,406. HAIR DRYER. Patented on Dec. 11, 1973 on an application by Esko J. Nopanen.

4,030,086. BATTERY VOLTAGE DETECTION AND WARNING MEANS. Patented on June 30, 1977 on an application by Robert J. Salem.

4,107,553. TIMER CONTROL CIRCUIT. Patented on Aug. 15, 1978 on an application by Robert A. Carter.

4,141,473. A SPOUT COVER ASSEMBLY. Patented on Feb. 27, 1979 on an application by B. L. Hudson.

Applications for license may be addressed to: Patent Counsel, Aircraft Engine Business Group, General Electric Co., 1000 Western Ave., Lynn, Mass. 01910.

3,508,403. TURBOFAN ENGINES.

3,533,712. COOLED VANE STRUCTURE FOR HIGH TEMPERATURE TURBINES.

3,772,090. ALLOY MICROSTRUCTURE CONTROL.

3,833,207. APPARATUS FOR ALLOY MICROSTRUCTURE CONTROL.

3,887,363. NICKEL-BASE SUPERALLOY CAST ARTICLE.

3,890,816. ELIMINATION OF CARBIDE SEGREGATION TO PRIOR PARTICLE BOUNDARIES.

3,983,379. RANDOM SAMPLE STATISTICAL FUNCTION ANALYZER.

4,029,477. COATED NI-CR BASE DISPERSION-MODIFIED ALLOY ARTICLE.

4,031,274. METHOD FOR COATING CAVITIES WITH METAL.

4,087,589. COATED ARTICLE.

4,137,949. METHOD OF MAKING A FIRE RETARDANT CONDUIT.

4,148,936. METHOD FOR DIFFUSION COATING AN FE-NI BASE ALLOY WITH CHROMIUM.

4,169,020. METHOD FOR MAKING AN IMPROVED GAS SEAL.

4,169,726. CASTING ALLOY AND DIRECTIONALLY SOLIDIFIED ARTICLE.

4,169,742. CAST NICKEL-BASE ALLOY ARTICLE.

4,177,004. COMBINED TURBINE SHROUD AND VANE SUPPORT STRUCTURE.

4,198,839. METHOD FOR MAKING LIGHTWEIGHT COMPOSITE ARTICLE.

4,214,355. METHOD FOR REPAIRING A TURBOMACHINERY BLADE TIP.

4,227,703. GAS SEAL WITH TIP OF ABRASIVE PARTICLES.

4,232,995. GAS SEAL FOR TURBINE BLADE TIP.

4,247,254. TURBOMACHINERY BLADE WITH IMPROVED TIP CAP.

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**Subscription Pricing Information**

The annual subscription prices on the following publications have been changed, as indicated below:

Title: Patent and Trademark Office Notices

| | |
|---|---|
| First-class domestic mailing | $75.00 |
| Second-class domestic mailing | 60.00 |
| Second-class foreign mailing | 75.00 |
| Single copies: not available | |

Foreign first-class mailing rates will be furnished upon request. Direct all inquiries and subscription requests to:

Superintendent of Documents
U.S. Government Printing Office
Washington, D.C. 20402

Checks for subscription orders should be made payable to Superintendent of Documents. If a Deposit Account with the Superintendent of Documents is to be used, please include the Deposit Account Number with the order.

This change is effective with Government Periodicals and Subscription Services Price List 36, dated Summer, 1982.

THERESA A. BRELSFORD,
June 3, 1982. *Acting Assistant Commissioner for Administration.*

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**New Location of Trademark Post Registration Section and Trademark Classification Team**

The Trademark Post Registration Section and Trademark Classification Team are moving from the lobby level of Crystal Plz. Building 1 to the 8th floor of Crystal Plz. Building 2 near the end of June. Access to application and registration files in these units may be interrupted for a day or two, but the units will remain open to the public every day. The telephone numbers will be unchanged: 703-557-2923 for the Post Registration Section; 703-557-3326 for the Classification Team.

The offices will be located on the 8th floor until late fall, at which time the entire Trademark Examining Operation will be consolidated on the 2nd, 3rd, and 4th floors of Crystal Plz. Building 2. A new directory of room numbers and telephone numbers for the Trademark Examining Operation will be published in the *Official Gazette* at that time.

MARGARET M. LAURENCE,
June 8, 1982. *Assistant Commissioner for Trademarks.*

## Status of PTO Services

The following is an update of the status of PTO services as of June 8, 1982:

| Service Item | FY 1982 Performance Goal (Calendar Days) | Actual | Comment |
|---|---|---|---|
| Internal Mail Processing & Delivery | 4 | 3.5 | See note below. |
| Filing Receipts: | | | |
| Patents | 22 | 79 | Reduction of 20 days since February. |
| Trademarks | 30 | 26 | Reduction of 1 day since last report. |
| Patent Copies: | | | |
| Window Coupons | 5 | 67% within 5 days<br>93% within 10 days | Significant improvements expected within a month. |
| Mail Coupons* | 15 | 99% within 15 days<br>99% within 20 days | Increased by 28%. |
| Letter Orders* | 20 | 95% within 20 days | |
| Certified Copies: | | | |
| Trademark Regs. | 30 | 26 | |
| Applications-As-Filed* | 20 | 95% within 15 days | |
| File-Wrapper/Contents* | | 20% within 15 days<br>85% within 30 days | |
| Walk-up Certification | 1 | 99% within 1 day | Service now includes applications-as-filed. |
| Trademark Search Room: | | | |
| Filing Drawings | 21 | 21 | |
| Filing Reg. Certificates | 3 | 3 | |
| Patent Assignments | 15 | 49 | Backlog due to unavailable funding. Expect reduction in FY 1983. |
| Trademark Assignments | 21 | 103 | Backlog due to unavailable funding. Expect reduction in FY 1983. |
| Patent Official Gazette | Issue Date | On Schedule | |
| Patent Grants | Issue Date | On Schedule | |
| Trademark Official Gazette | Issue Date | On Schedule | |
| Trademark Registrations | Issue Date | On Schedule | |

*Figures exclude mail processing and delivery time.

Note: Mail Processing and Delivery

The statistics for mail processing and delivery indicate the average time required to process mail from the time it is received in the Mail Room of the Patent and Trademark Office until it is delivered to the organization. For example, it reflects the time it takes for a paper to be delivered to an Examining Group, not the Examiner. Mail often receives additional clerical processing in the Group, depending on the type of document. It is not unusual for mail to take a few weeks to actually reach the Examiner. However, the official receipt date is that which is stamped in the Mail Room, reflecting the date the mail was received in the Office.

June 8, 1982.

THERESA A. BRELSFORD,
*Acting Assistant Commissioner for Administration.*

# PATENT NOTICES

**Certificates of Correction for the Week of June 29, 1982**

| | | | |
|---|---|---|---|
| Re. 29,783 | 4,304,101 | 4,314,268 | 4,322,692 |
| 4,178,233 | 4,304,466 | 4,315,010 | 4,322,825 |
| 4,211,602 | 4,304,673 | 4,315,091 | 4,322,863 |
| 4,211,881 | 4,305,306 | 4,315,314 | 4,322,899 |
| 4,218,217 | 4,305,348 | 4,315,537 | 4,323,010 |
| 4,221,688 | 4,305,460 | 4,316,490 | 4,323,187 |
| 4,228,514 | 4,306,006 | 4,316,900 | 4,323,385 |
| 4,230,976 | 4,307,295 | 4,317,124 | 4,323,425 |
| 4,246,747 | 4,308,486 | 4,317,704 | 4,323,443 |
| 4,265,785 | 4,308,598 | 4,317,735 | 4,323,537 |
| 4,267,629 | 4,308,866 | 4,317,996 | 4,323,592 |
| 4,270,036 | 4,309,239 | 4,318,101 | 4,323,846 |
| 4,270,730 | 4,310,145 | 4,318,112 | 4,324,150 |
| 4,281,565 | 4,310,595 | 4,318,674 | 4,324,293 |
| 4,282,449 | 4,310,648 | 4,319,756 | 4,326,867 |
| 4,289,795 | 4,310,722 | 4,319,926 | 4,326,977 |
| 4,292,105 | 4,311,285 | 4,320,020 | 4,327,063 |
| 4,292,449 | 4,311,379 | 4,320,106 | 4,327,096 |
| 4,293,801 | 4,311,790 | 4,320,749 | 4,327,235 |
| 4,295,602 | 4,312,203 | 4,320,945 | 4,327,416 |
| 4,296,811 | 4,312,205 | 4,321,054 | 4,327,565 |
| 4,298,903 | 4,312,575 | 4,321,841 | 4,327,843 |
| 4,299,010 | 4,312,778 | 4,322,109 | 4,328,001 |
| 4,299,135 | 4,312,784 | 4,322,347 | 4,328,267 |
| 4,302,914 | 4,313,214 | 4,322,459 | |
| 4,303,795 | 4,313,446 | 4,322,590 | |

**Dedication**

4,111,657.—*Jerry W. Denney,* Carmel, Ind., and *Robert L. Long,* Spartanburg, S.C. CREATININE ASSAY AND REAGENT SYSTEM. Patent dated Sept. 5, 1978. Dedication filed Feb. 25, 1982, by the assignee, *American Monitor Corp.*

Hereby dedicates to the Public the entire remaining term of said patent.

**Disclaimers**

3,990,460.—*John C. Shalvoy,* Fairfield, Conn. DRYING HAIR CURLER. Patent dated Nov. 9, 1976. Disclaimer filed Apr. 30, 1982, by the assignee, *General Electric Co.*

Hereby enters this disclaimer to all claims of said patent.

4,031,661.—*Robert B. Bernhard,* Port Washington, N.Y. MINIATURE VEHICLE WITH MAGNETIC ENHANCEMENT OF TRACTION. Patent dated June 28, 1977. Disclaimer filed Mar. 15, 1982, by the assignee, *Aurora Products Canada, Ltd.*

The term of this patent subsequent to June 22, 1993, has been disclaimed.

4,103,932.—*Robert J. Parker,* Southfield, Mich. PIVOT CONSTRUCTION FOR A MOTOR VEHICLE SUSPENSION SYSTEM. Patent dated Aug. 1, 1978. Disclaimer filed Apr. 14, 1982, by the assignee, *Ford Motor Co.*

Hereby enters this disclaimer to claims 1, 3, 4 and 6 of said patent.

4,224,024.—*Helmut Gies,* Hofheim/Taunus and *Fritz Meininger,* Frankfurt/Main, Germany. PROCESS FOR THE REACTIVE DYEING AND PRINTING OF FIBROUS MATERIALS CONTAINING HYDROXY GROUPS WITH A WATER-SOLUBLE ORGANIC DYESTUFF CONTAINING AT LEAST ONE PHOSPHONIC ACID-MONOFLUORIDE GROUP AND AT LEAST ONE IONIC WATER-SOLUBILIZING GROUP. Patent dated Sept. 23, 1980. Disclaimer filed May 3, 1982, by the assignee, *Hoechst Aktiengesellschaft.*

Hereby enters this disclaimer to claims 6 and 7 of said patent.

4,297,350.—*John C. Babcock;* and *J. Allan Campbell,* Kalamazoo, and *Thomas J. Lobi,* Portage, Mich. MALE CONTRACEPTIVE STEROIDS AND METHODS OF USE. Patent dated Oct. 27, 1981. Disclaimer filed May 15, 1982, by the assignee, *The Upjohn Co.*

Hereby enters this disclaimer to claims 192, 194-196 and 198-203 of said patent.

4,307,316.—*Ian C. McKechnie,* Las Vegas, Nev. SELF CLEANING SPARK PLUG. Patent dated Dec. 22, 1981. Disclaimer filed Apr. 19, 1982, by the inventor.

Hereby enters this disclaimer to claims 3 and 4 of said patent.

**Disclaimers and Dedications**

3,912,336.—*Arthur J. Ritter, Jr.,* Metamore, and *David L. Perry,* Peoria, Ill. PROTECTIVE SHROUD FOR THE DRIVE SPROCKET OF A TRACK-TYPE VEHICLE. Patent dated Oct. 14, 1975. Disclaimer and Dedication filed Apr. 19, 1982, by the assignee, *Caterpillar Tractor Co.*

Hereby disclaims and dedicates to the Public the entire remaining term of said patent.

4,098,770.—*Antoine Berchem,* St-Hippolyte; *Krishan Kumar Sudan,* Le-Corbusier and *Edward Michael Gres,* Weston, Canada. SPRAY-DRIED PHENOLIC ADHESIVES. Patent dated July 4, 1978. Disclaimer and Dedication filed May 7, 1982, by the assignee, *Reichhold Ltd.*

Hereby disclaims and dedicates to the Public the entire term of said patent.

4,325,777.—*John C. Yarwood,* Madison; *Derek E. Tyler,* Cheshire and *Joseph Winter,* New Haven, Conn. METHOD AND APPARATUS FOR REFORMING AN IMPROVED STRIP OF MATERIAL FROM A STARTER STRIP OF MATERIAL. Patent dated Apr. 20, 1982. Disclaimer and Dedication filed Apr. 27, 1982, by the assignee, *Olin Corp.*

Hereby disclaims and dedicates to the Public the remaining term of said patent.

DEPARTMENT OF COMMERCE
Patent and Trademark Office
37 CFR Parts 1 and 3

Revision of Fees

AGENCY: Patent and Trademark Office, Commerce

ACTION: Notice of proposed rulemaking.

SUMMARY: The Patent and Trademark Office proposes to amend the rules of practice in patent cases to establish procedures and fees in amounts which comply with the requirements of Public Law 96-517 or which would apply with enactment of H.R. 6260 as a Public Law. A separate rulemaking proposal is being published relating to trademark fees.

DATES: Comments must be submitted on or before July 9, 1982; a public hearing will be held July 9, 1982, 9:30 a.m.; requests to present oral testimony should be received prior to July 9, 1982.

ADDRESSES: Address written comments and requests to present oral testimony to the Commissioner of Patents and Trademarks, Attention: R. Franklin Burnett, Room 3-11A13, Washington, D. C. 20231. The hearing will be held in Room A of Suite 1006 on the 10th floor of Building 5, Crystal Square, located at 1755 South Jefferson Davis Highway, Arlington, Virginia. Written comments and a transcript of the public hearing will be available for public inspection in Room 11E10 of Building 3, Crystal Plaza at 2021 Jefferson Davis Highway, Arlington, Virginia.

FOR FURTHER INFORMATION CONTACT: R. Franklin Burnett by telephone at (703) 557-3054 or by mail marked to his attention and addressed to the Commissioner of Patents and Trademarks, Washington, D. C. 20231.

SUPPLEMENTARY INFORMATION: This proposed rule change is designed primarily to implement the Patent and Trademark Office fees which are provided for by Public Law 96-517, or which would be set in, or provided for by, H.R. 6260.

## Public Law 96-517

Public Law 96-517 presently requires that fees be established by the Commissioner for the processing of patent applications from filing through issuance or abandonment, for maintaining a patent in force, and for providing all other services and materials related to patents. Public Law 96-517 requires that by October 1, 1982, fees for the processing of patent applications, other than design patents, be set by the Commissioner to recover in aggregate 25 per centum of the estimated average cost to the Office of such processing. Similarly, fees for processing design

patents are to be set to recover in aggregate 50 per centum of the estimated average cost to the Office of such processing. By October 1, 1982, fees for all other services or materials related to patents are to be set to recover the estimated average cost to the Office of performing the service or furnishing the material.

Public Law 96-517 also requires that fees be set for maintaining all patents filed on or after December 12, 1980, other than design patents, in force. It also requires that maintenance fees must recover 25 per centum of the estimated cost to the Office of processing patent applications, other than design patent applications, by the fifteenth fiscal year following December 12, 1980. Under Public Law 96-517, the maintenance fees are due 3½, 7½, and 11½ years after grant of the patent.

Public Law 96-517 is presently effective and this rule change is designed to implement the fee provisions of that law if it remains fully effective on October 1, 1982. However, on June 8, 1982, the House of Representatives passed H.R. 6260. This rule change proposal is also designed to permit the implementation of the fee provisions of H.R. 6260. This proposed rule change is intended to obtain comments which would enable a final rulemaking to be adopted based on Public Law 96-517 and/or on H.R. 6260, without a further notice of proposed rulemaking. Accordingly, comments on proposed rule changes which are common to Public Law 96-517 and to H.R. 6260 are requested herein as well as comments on alternative rule changes which are specific to Public Law 96-517 (Alternative A) and to H.R. 6260 (Alternative B).

H.R. 6260

H.R. 6260 would establish a number of statutory fees which the Commissioner is required to charge. Among the more significant of these are fees for filing, issuing, and maintaining a patent in force. The fees for filing and issuing a patent would be set forth in §41(a) of Title 35, United States Code, as proposed to be amended by H.R. 6260. Certain other fees, such as appeal fees, the fee for filing a disclaimer, and fees for filing petitions seeking to revive an abandoned application and for extensions of time, would also be set in §41(a) of Title 35, United States Code. Section 41(b) of Title 35, United States Code, as proposed to be amended by H.R. 6260, would set forth the fees for maintaining a patent in force. These fees would be due 3½, 7½, and 11½ years after grant of the patent or within a grace period of six months thereafter. Section 41(c) of Title 35, United States Code, as proposed to be amended by H.R. 6260, would provide for the acceptance of maintenance fees after the statutory grace period under certain conditions and with certain effects.

H.R. 6260 would also provide for the reduction by 50 per centum in the fees paid under §41(a) and (b) of Title 35, United States Code, by independent inventors, small business concerns, and

nonprofit organizations, who meet the definitions established, and to be established therefor.

Section 41(d) of Title 35, United States Code, as proposed to be amended by H.R. 6260, would also provide that the Commissioner establish fees for all other processing, services, or materials related to patents which are not covered in §41(a)-(c) of Title 35, United States Code, to recover the estimated average cost to the Office of the processing, services, or materials. H.R. 6260 includes other provisions which would be the subject of other proposals for rulemaking.

This proposed rulemaking places into the appropriate sections of Title 37, Code of Federal Regulations, the various fees which are due on filing, during the pendency of a patent application, or during the term of a patent. A number of significant changes are proposed in order to implement either Public Law 96-517 or H.R. 6260.

Under H.R. 6260, and Alternative B of this proposed rulemaking, fees under §41(a) and (b) of Title 35, United States Code, would be reduced by 50 per centum for independent inventors, small business concerns, and nonprofit organizations. H.R. 6260 would give the Commissioner authority to establish regulations defining independent inventors and nonprofit organizations. H.R. 6260 defines small business concerns by reference to §3 of the Small Business Act and regulations established by the Small Business Administration. This proposed rulemaking proposes implementation of the fee system which would be established by H.R. 6260 and lists all applicable fees.

Another significant change contained in this proposal relates to fees established under Public Law 96-517 and which would be established by H.R. 6260 for petitions for extensions of time to take actions required by the Commissioner in an application. H.R. 6260 would establish a fee of $50 for filing a petition for a first one-month extension of time, an additional fee of $100 for filing a petition for a second one-month extension of time which would expire two months after the end of the time period set for taking action, and an additional fee of $200 for filing a petition for a third one-month extension of time which would expire three months after the end of the time period set for taking action. A fourth one-month extension with an additional fee of $200 could be requested if additional time was available under the statute. Under H.R. 6260, the Commissioner would have authority to issue regulations providing when, within any maximum time period permitted by statute, petitions for extensions of time, and the required fee therefor, may be filed. The Commissioner would also not be precluded by H.R. 6260 from waiving the fee for filing a petition for an extension of time where the Office extends the period due to equity considerations or sufficient cause. This proposed rulemaking proposes to implement the extension of time provisions of H.R. 6260 by

permitting applicants in the majority of situations to file the petition for an extension of time and the fee at the time of and along with the filing of the response for which a non-statutory or shortened statutory time period has been set. This would reduce the amount of paperwork involved and should significantly reduce the expenses of applicants and the Office since resources now devoted to the separate processing of petitions for extensions of time would no longer be required to be expended thereon. The fees are set to provide a proper control on the number of extensions of time given. This proposal would establish, under Public Law 96-517, the same procedures relating to extensions of time which would be established under H.R. 6260.

Another significant change contained in this proposal relates to the implementation of the fee for revival of an unintentionally abandoned application which would be authorized under H.R. 6260. H.R. 6260 would establish two different fees for filing petitions with different standards to revive abandoned patent applications. The same two fees would be applicable to petitions to accept the delayed payment of the fee for issuing a patent. Under H.R. 6260, a fee of $50 would be established in §1.17(l) for filing a petition for revival under §§133 or 151 of Title 35, United States Code, in accordance with standards presently in effect where the delay resulting in the abandonment, or the delay in payment of the issue fee, was unavoidable. Under H.R. 6260, a fee of $500 would be established in §1.17(m) for filing each petition for revival, or for acceptance of the delayed payment of an issue fee, where the abandonment or the failure to pay the issue fee was unintentional. A mere statement that abandonment was unintentional plus the $500 fee is all that would be required in this case for this purpose. Under H.R. 6260 and the proposed rulemaking an applicant would have a choice of which petition and fee to file seeking revival depending on the circumstances involved.

The proposed rulemaking also provides for fees for filing certain petitions which have, in some cases, heretofore, been decided without a charge. These fees are proposed under Public Law 96-517 and are provided for by the amendment of §41(d) of Title 35, United States Code, which would be introduced by H.R. 6260. Under §41 of Title 35, United States Code, as amended by Public Law 96-517 or as it would be amended by H.R. 6260, fees are provided for the processing of various petitions desiring certain actions to be taken regarding patent applications, for the recording of assignments, for reexamination of patents, and for the processing of international applications under the Patent Cooperation Treaty. In general, fees are not being proposed for those petitions which are supervisory in nature. For example, where applicants are petitioning from an allegedly improper action of the examiner, it is felt that such petitions should be processed and decided without charge since they are not asking for any special privilege but are attempting to correct an allegedly incorrect Office holding.

Many of the fees currently set forth in §1.21 are proposed to be increased to reflect the cost of currently performing that service.

DISCUSSION OF SPECIFIC SECTIONS PROPOSED TO BE CHANGED

The sections proposed to be changed are grouped in this proposal under three different categories. Those changes which are common to Public Law 96-517 and H.R. 6260 appear first and are numbered 1-56. Those changes which relate only to Public Law 96-517 appear as Alternative A and are numbered 57-63. Those changes which are dependent upon enactment of H.R. 6260 appear as Alternative B and are numbered 64-74.

Proposed Rule Changes Common To Public Law 96-517 and H.R. 6260

The following sections are proposed to be changed under either Public Law 96-517 or H.R. 6260:

Section 1.11, if amended as proposed, would change the reference for the reexamination request fee to that proposed in this change.

Section 1.12, if amended as proposed, would break the section into four paragraphs. Proposed paragraph (a) maintains current practice but adds specific reference to §1.19(a)(5) which sets the cost of copies. Proposed paragraph (b) maintains current wording except for changing "his" to "applicant's". Proposed paragraph (c) includes new language relating to obtaining copies of assignment records not open to the public. Access can be obtained only with the applicant's permission or by petition with fee to the Commissioner for such access in particular situations. No change in the showing required by petition to obtain access is intended by this proposal. Proposed paragraph (d) contains present language except for reference to the specific rule which sets forth the charge for time consumed in making assignment searches.

Proposed new paragraph (e) of §1.14, if added as proposed, would set forth the two ways in which access can be obtained to patent applications which are not open to the public. The two ways are (1) by petitioning and paying the petition fee and approval of the Commissioner of such petition and (2) by obtaining written approval from the applicant.

Proposed new §1.19 would provide fees for copies of various documents supplied by the Office. The fees have been grouped into 5 paragraphs. Proposed new paragraph (a) provides fees for uncertified copies. Proposed subparagraphs (a)(1) and (2) indicate the prices of printed patent copies. Proposed subparagraph (a)(3) would provide a single fee for a copy of an application, as filed, for each 50 pages, or fraction thereof.

This practice should make it much easier to determine the amount of the required fee. Proposed subparagraph (a)(4) would set a single fee for a copy of each 100 pages, or fraction thereof, of a patent file wrapper. Proposed subparagraph (a)(5) would provide for a charge of 30 cents per page for copies of Office records other than those covered by proposed subparagraphs (a)(3) and (4). Proposed subparagraph (a)(6) would provide a fee for a microfiche copy of a microfiche.

Proposed paragraph (b) of §1.19 sets fees for certified copies of Office documents. Subparagraph (b)(1) sets a fee for certifying Office records. Subparagraph (b)(2) provides a single fee for searching assignment records, preparing an abstract of the title and certification thereof. Subparagraph (b)(3) provides a fee for comparing copies not prepared by the Office prior to certification in order to provide basis for certification. Proposed paragraph 1.19(c) sets the fees for subscribing to all of the patents issued annually in particular subclasses. This charge is in addition to the normal copy charge under §1.19(a)(1) and (2). Proposed paragraph 1.19(d) sets the fee for providing patent copies to libraries under 35 U.S.C. 13. Proposed paragraph 1.19(e) provides fees for lists of United States patents in particular subclasses.

Section 1.21, if amended as proposed, would contain those miscellaneous fees which do not relate to the topics covered in proposed §§1.16-1.20. Current §1.21 has not been reproduced to show deletions in view of the length of the present rule. All of the fees in §1.21 are proposed under the authority given the Commissioner by 35 U.S.C. 41(d) as amended by Public Law 96-517 or as proposed in H.R. 6260. Proposed paragraph 1.21(a) would establish fees for admission to the examination for registration to practice, registration, reinstatement and issuance of certificates of good standing of patent attorneys and agents. Proposed subparagraph 1.21(b)(1) sets forth the fee for establishing and reinstating deposit accounts, while subparagraph 1.21(b)(2) sets forth the fee due when the balance at the end of each month is below $40. Proposed paragraph 1.21(c) sets the fee for filing a disclosure document. Proposed paragraph 1.21(d) sets the fee for renting a delivery box. Proposed paragraph 1.21(e) sets the fee for an international-type search report. Although all national applications now receive what is known as an international-type search, if a report thereof is desired in addition to an Office action, the fee set in §1.21(e) is required. Proposed paragraph 1.21(f) sets a fee for searching Office records for purposes not otherwise specified. Proposed paragraph 1.21(g) sets the fee for tokens for copying machines. Proposed paragraph 1.21(h) would set the fee for recording assignments, agreements, and other documents. Proposed paragraph 1.21(i) would set forth the fee for publishing a notice of availability of a patent for licensing or sale in the Official Gazette. Proposed paragraph 1.21(j) would set the fee for the Office providing a duplicate or replacement of a permanent Office

user pass. Proposed paragraph 1.21(k) would indicate that the Commissioner may specify charges for items and services not otherwise specified at a level to recover the actual cost of providing such a service by the Office.

Section 1.24 is proposed to be revised so that the denomination of coupons sold by the Office will be in more convenient amounts for fees as proposed.

Section 1.25, if amended as proposed, would provide in paragraph (a), a reference to the fee for establishing a deposit account and a service charge if the end of the month balance is below $40.00. Paragraph (b) is proposed to be amended by revising the present sentence to refer to post-issuance fees and by adding a second sentence which would specifically provide in the regulations for the possibility of an applicant giving a general authorization to charge any fee due under §§1.16-1.18 in a particular application to a deposit account during the entire pendency of the application. This general authorization would not apply after the patent issues, e.g., to maintenance fees. The last sentence of paragraph (b) would permit fees during reexamination to be charged to a deposit account by filing an authorization with the request for reexamination.

Section 1.26, if amended as proposed, would provide in paragraph (a) that a withdrawal of a request for an oral hearing would not entitle appellant to a refund. Proposed paragraph 1.26(a) would also raise the amount which would not be refunded without specific request from fifty cents to one dollar. Present paragraph (b) relating to refunds of international search fees during subsequent examination of a national application would be deleted since such refunds have been found to be without a sound financial basis and cause difficulties in administration. The time difference required to prepare international search reports with and without a prior application has been found to be very small and the effort required to process refunds has been found to be quite large. Accordingly, it is proposed that paragraph (b) be deleted. Paragraph (c) is proposed to be amended to bring the spelling of "requester" into conformance with that used in other sections of the regulations.

Section 1.45, if amended as proposed, would provide in paragraphs (b) and (c) for a petition and petition fee to be filed to correct misjoinder of inventorship situations in pending applications. The fee would cover the additional time required by the Office to process such applications.

Section 1.47, if amended as proposed, would provide for petitions and fees for filing applications signed by less than all inventors.

Section 1.51, if amended as proposed, would refer to the filing fees in proposed new §1.16 and add a new paragraph (c) indicating

that applicants may file authorizations to charge fees required under any of §§1.16-1.18 to deposit accounts.

Section 1.52, if amended as proposed, would add a reference in paragraph (a) to proposed new paragraph (d). Proposed new paragraph (d) would provide in the rules for filing an application in a language other than English if a verified English translation and fee under §1.17(k) are timely submitted.

Section 1.55, if amended as proposed, would amend paragraph (b) to require a petition and fee for processing priority papers submitted after the issue fee is paid.

Section 1.75, if amended as proposed, would add a reference to proposed §1.16 and a sentence referring to the fee for multiple dependent claims set forth in proposed §1.16(d).

Section 1.85, if amended as proposed, would delete the sentence relating to mounting of informal drawings.

Section 1.86, if removed as proposed, would delete the reference to the Office draftsman making drawings since such service is no longer available.

Section 1.102, if amended as proposed, would amend paragraph (a) and add new paragraphs (c) and (d). Revised paragraph (a) would refer to paragraph (b) and added paragraphs (c) and (d). Proposed paragraph (c) requires a petition but no fee where the basis for the petition to make special is the applicant's age or health or the impact of the invention on improving the environment or conservation of energy. Proposed paragraph (d) would require a petition and the fee set forth in §1.17(i) for petitions to make special on grounds other than those above.

Section 1.103, if amended as proposed, would amend paragraph (a) to provide for filing a petition and the fee set forth in §1.17(i) for a suspension of action except that no fee would be required where the reason for the suspension is the fault of the Patent and Trademark Office. Paragraph (b) is amended to clearly indicate that suspensions are directed to actions by the Office and not responses by the applicant.

Section 1.104, paragraph (d), if amended as proposed, would change the fee reference to correspond to proposed §1.21(e).

Section 1.134, if added as proposed, would indicate that unless applicant is notified of any non-statutory or shortened statutory period in an Office action, a maximum period for response of six months is allowed.

Section 1.135, if amended as proposed, would provide that if no response is filed within the time set in the Office action under proposed §1.134 or as it may be extended under proposed §1.136,

the application would be abandoned unless an Office action would indicate that another consequence, such as disclaimer, would take place. Paragraph (b), as proposed, would include a reference to paragraph (a). Paragraph (c), as proposed to be amended, would add that applicant's reply must be a bona fide attempt to respond as well as to advance the case to final action in order for applicant to be given an opportunity to supply any omission.

Section 1.136, if amended as proposed, would revise the title and provide for two distinct procedures to extend the period for action or response in particular situations. The procedure which is available for use in a particular situation would depend upon the circumstances. Paragraph 1.136(a), as proposed, would permit an applicant to file a petition for extension of time and a fee as proposed in §1.17(a), (b), (c), or (d) up to four months after the end of the time period to take action except (1) where prohibited by statute, (2) in interference proceedings, or (3) where applicant has been notified otherwise in an Office action. The petition and fee could be filed prior to or with the response. The filing of the petition and fee would extend the time period to take action up to four months dependent on the amount of the fee paid except in those circumstances noted above. Proposed paragraph 1.136(a) would effectively reduce the amount of paperwork required by applicants and the Office since the extension would be effective upon filing of the petition and without acknowledgment or action by the Office and since the petition and fee could be filed with the response. Proposed paragraph (b) provides for requests for extensions of time upon a showing of sufficient cause when the procedure of proposed paragraph (a) is not available. Although the petition and fee procedure of §1.136(a) would normally be available within 4 months after a set period for response has expired, an extension request for cause under §1.136(b) must be filed during the set period for response. If paragraph (b) is amended as proposed, the sentence relating to who may grant an extension under paragraph (b) would be eliminated thereby providing additional flexibility to designate persons to act on requests under paragraph (b). Extensions of time in interference proceedings are governed by §1.245.

Section 1.165, paragraph (b), if amended as proposed, would have deleted therefrom the last sentence which refers to a fee for mounting copies. Since little or no need has been found for this provision in the rules, it is being proposed to be deleted.

Section 1.171, as proposed, would add a reference to proposed §1.19(b)(2) which sets forth the fee for title reports.

Section 1.177, if amended as proposed, would require a petition and fee as set forth in proposed §1.17(i) where it is desired that divisions of a reissue issue on different dates.

Section 1.181, if amended as proposed, would indicate in paragraph (d) that if a petition to the Commissioner is filed under the provisions of a section which requires a petition fee and the required fee is not paid, the petition will be dismissed. The proposed amendment to paragraph (g) would delete the reference to §1.183.

Section 1.182, if amended as proposed, would add a sentence requiring any petition filed under this section to be accompanied by the petition fee set forth in §1.17(h).

Section 1.183, if amended as proposed, would specifically provide for the inherent authority of the Commissioner to suspend or waive the rules at the Commissioner's initiative. The proposed amendment also recognizes the Commissioner's authority to designate others to act for the Commissioner in appropriate circumstances. The proposed rule language would also require the payment of the petition fee set forth in §1.17(h) if a petition to suspend or waive the rules is filed.

Section 1.191, if amended as proposed, would change the fee reference for filing a notice of appeal to proposed §1.17(e) and would delete the word "primary" since some actions which are subject to appeal are not made by a "primary" examiner.

Section 1.192, paragraph (a), if amended as proposed, would refer to the fee for filing an appeal brief set forth in proposed §1.17(f) and the fee for an oral hearing set forth in proposed §1.17(g). It is also proposed to remove from paragraph 1.192(a) the present language requiring a showing of sufficient cause for extensions of time for filing the brief. Under the proposed amendment to paragraph 1.192(a), the provisions of §1.136 would apply to extensions of time for filing the brief.

Section 1.194, if amended as proposed, would revise paragraphs (b) and (c) to refer to the fee for oral hearing in proposed §1.17(g).

Section 1.197, paragraph (b), if amended as proposed, would modify the last sentence relating to extensions of time to make the provisions of §1.136 applicable thereto. Paragraph 1.197(b) is also proposed to be amended to limit requests for rehearing, reconsideration or modification of a Board decision to one. This would not significantly change present practice since such requests are now required to be filed within thirty days from the date of the original decision.

Section 1.231, paragraph (a)(1), if amended as proposed, would change the reference to the fee for filing a request for reexamination to §1.20(c).

Sections 1.245 and 1.246, if amended as proposed, would indicate that the provisions of proposed §1.136 do not apply to time periods in interferences.

Section 1.263, if amended as proposed, would add a reference to the proposed fee for filing a disclaimer contained in proposed §1.20(d).

New section 1.268, if added as proposed, would provide a rule relating to the filing of interference settlement agreements. The rule generally follows 35 U.S.C. 135(c) and provides for filing of petitions and fees in proposed paragraphs 1.268(b) and (c).

Section 1.292, paragraph (a), if amended as proposed, would require the payment of the fee set forth in proposed §1.17(j) with any petition for the institution of public use proceedings.

Section 1.304, paragraph (a), if amended as proposed, would provide for extension of the time period for filing an appeal or civil action to be subject to the proposed provisions of §1.136 and refer to the Court of Appeals for the Federal Circuit rather than to the Court of Customs and Patent Appeals.

Section 1.311, if amended as proposed, would designate the present section as paragraph (a) and revise it in several ways. Proposed paragraph (a) would indicate that the notice of allowance would be sent to the correspondence address as indicated under §1.33. The issue fee (§1.18) would be indicated as being due 3 months from the date of mailing of the notice of allowance. Proposed paragraph 1.311(b) would permit an authorization to be filed either before or after the mailing of the notice of allowance to charge the issue fee to a deposit account.

Section 1.312, if amended as proposed, would divide the section into two paragraphs and would require a petition and payment of the fee under §1.17(i) for any amendment filed after payment of the issue fee.

Section 1.313, if amended as proposed, would provide in paragraph (a) clear basis for the Office withdrawing applications from issue on its own initiative or upon petition by applicant accompanied by the petition fee set forth in proposed §1.17(i). Any accompanying amendment must comply with the requirements of proposed §1.312. Proposed paragraph (b) clarifies when an application will be withdrawn from issue after assignment of the issue date and patent number.

Section 1.314, if amended as proposed, would revise the wording in view of the proposed issue fees and would add reference to the possibility that an application in which the issue fee was paid

could be withdrawn from issue under §1.313 or the issuance thereof deferred pursuant to a petition by the applicant and the payment of the petition fee under §1.17(i).

Section 1.317, paragraph (a), is proposed to be amended to show that it applies only to applications in which the issue fee was paid prior to October 1, 1982. Issue fees paid on or after that date will be in accordance with §1.18.

Section 1.321, if amended as proposed, would include references in both paragraphs (a) and (b) to the statutory disclaimer fee in proposed §1.20(d) and delete the reference to §1.21.

Section 1.324, if amended as proposed, would include reference to the fee in proposed §1.20(b) and change the word "application" to --petition--.

Section 1.331, paragraph (a), if amended as proposed, would have a new sentence which gives the citation of the fee for recording assignments and indicates that instruments recorded on the Government register under Part 7 of Title 37, Code of Federal Regulations do not require payment of such fee.

Section 1.332, if amended as proposed, would refer to the proposed fee in §1.21(h) for recording an assignment.

Section 1.334, if amended as proposed, would divide the rule into three paragraphs and would also require an address of the assignee so that correspondence could be directed to the assignee if required. Proposed new paragraph (c) would provide for filing a petition and the fee set in proposed §1.17(i) seeking to have the patent issue to the assignee where such assignment was not recorded at the time the issue fee was paid.

Section 1.341, paragraph (h), if amended as proposed, would refer to the proposed fee set forth in §1.21(a)(2) for registration of an attorney or agent.

Section 1.347, if amended as proposed, would add a sentence referring to the proposed fee set forth in §1.21(a)(3) for reinstatement of an attorney or agent.

Section 1.445, if amended as proposed, would increase the PCT transmittal fee and search fee to a level needed to cover the cost of performing the required functions. The supplemental search fee for inventions in addition to the first, where lack of unity of invention has been found, is being proposed to be reduced since the present fee is more than is required to cover the costs. The national fee amount is proposed to be the same as the national application filing fees in proposed §1.16(a)-(d).

Section 1.446, if amended as proposed, would delete paragraph (b) which provides for refunds of PCT search fees where such search

is based in part on an earlier application. Experience has shown that the value of the earlier search and the cost of processing refunds do not warrant the substantial refund provisions and that the refund provisions are difficult to administer equitably.

Section 1.451, if amended as proposed in paragraph (b), would revise the citation of the fees for a certified copy.

Section 1.510, if amended as proposed, would cite the proposed section which sets forth the fee for requesting reexamination. There is no change in the amount of this fee.

Part 3, if deleted as proposed, would eliminate all of the patent forms from the Code of Federal Regulations. The Patent and Trademark Office has prepared a booklet entitled "Patent and Trademark Forms Booklet" which is available from the Superintendent of Documents and includes full size copies of substantially all of the forms in Part 3. Since the forms are not mandatory, no need is seen to retain them in the Code of Federal Regulations.

Alternative A - Proposed Rule Changes Under Only Public Law 96-517

The following sections are proposed to be changed under only Public Law 96-517:

Proposed new §1.16 relates to application filing fees. Proposed paragraph (a) sets a basic filing fee of $150 which would be required in all original patent applications. The term "original" as used in the regulations means "non-reissue". An "original" application could be a first filing, a division, a continuation, or a continuation-in-part application. Proposed paragraph 1.16 (b) provides for an additional fee of $15 for each independent claim in excess of 3 in an original application. Proposed new paragraph 1.16(c) would provide for an additional fee of $5 for each claim in excess of 20, whether independent or dependent. A multiple dependent claim will be considered to be that number of claims to which direct reference is made. Also, any claim which refers to a multiple dependent claim will be considered for fee calculation purposes to be the number of claims to which direct reference is made in the multiple dependent claim. Proposed paragraph 1.16(d) provides for a new fee of $50 in each application which contains one or more multiple dependent claims. The note following proposed paragraph 1.16(d) is intended to clearly indicate that the applicant, attorney, or agent may pay any additional fees required under proposed paragraphs (b), (c) and (d) of §1.16, or cancel such claims without payment of such additional fees, either at the time of filing or by the time a response is due to any notice of fee deficiency mailed by the Office. If the fees are not paid or the claims cancelled by the end of the period set for response to the notice of fee deficiency, the application would be held

abandoned. Paragraph 1.16(e) would be reserved under this Alternative (Alternative A). Proposed new paragraph 1.16(f) provides for a filing fee of $63.00 for a design application.

Proposed paragraphs 1.16(g) and (h) would establish the filing fees for plant and reissue applications.

Proposed paragraphs 1.16(i) and (j) would set forth the additional claim fees required in reissue applications based on claims in excess of those in the original patent.

Proposed new §1.17 relates to patent application processing fees which are normally due during the time a patent application is pending. Proposed new paragraphs (a), (b), (c) and (d) provide for the payment of an extension fee for obtaining an automatic extension of time upon filing a petition as provided for in proposed §1.136(a). The extension fee could be paid during the period for which an extension of time to respond is desired, or after the original period for response has expired, provided that any maximum statutory period which may apply has not expired. The fees set forth in proposed §1.17 are the total fees required under §1.136(a) for the periods indicated and any extension fee previously paid to extend a particular period is credited toward the total extension fee required. Proposed paragraph (e) would set forth the fee for filing a notice of appeal to the Board of Appeals. Proposed paragraph (f) would set forth the fee for filing an appeal brief by appellant. Proposed paragraph (g) would provide for a new fee for requesting an oral hearing before the Board of Appeals. Proposed paragraphs (h) and (i) would set forth fees which would be required with petitions to the Commissioner under those sections of the regulations which specifically indicate that such petition fees are required. The amounts of the fees are set at two levels based on the degree of complexity of the petitions in order to recover the estimated average cost to the Office of processing the petitions. Proposed paragraph (j) would provide for a fee to be paid with any petition for institution of a public use proceeding to cover the estimated average cost of such a proceeding. Proposed new paragraph (k) would set forth a new fee for processing an application filed with a non-English language specification. The fee would cover the additional processing costs involved in such applications. Proposed new paragraph (l) would incorporate into the regulations the fee which would be charged for filing a petition to revive or to accept late payment of the issue fee where the delay was unavoidable.

Proposed new §1.18 would set the amount of the issue fees pursuant to the authority contained in Public Law 96-517. Proposed new paragraph (a) would establish an issue fee of $250.00 for all original and reissue patents except for designs and plants. Proposed new paragraph (b) would set the amount of the issue fee for a design patent at a uniform $88.00 even though

terms of 3½, 7, or 14 years may be requested. Proposed new paragraph (c) would establish the issue fee for a plant patent.

Proposed new §1.20 would set fees for various post-issuance functions performed by the Office. Proposed new paragraph (a) would set forth a fee for providing a certificate of correction of an applicant's mistake. Proposed new paragraph (b) would set a fee to accompany a petition to correct inventorship in a patent under §1.324. Proposed new paragraph (c) would transfer the $1,500.00 fee for requesting reexamination from present §1.21(x) to this new section. Proposed new paragraph (d) would provide for a fee for filing a disclaimer under §1.321. Maintenance fees required by Public Law 96-517 are placed in this section. Specific maintenance fees, which are required by Public Law 96-517, for those patents resulting from applications filed on and after December 12, 1980 and up to the date of enactment of H.R. 6260 are being proposed at this time in paragraphs 1.20(e)-(g). The fees proposed in paragraphs 1.20(e)-(g) are only set at one level because they are proposed under Public Law 96-517 and are not subject to reduction for small entities. The details implementing the payment of maintenance fees are not being proposed at this time.

Section 1.137, as proposed, would designate the existing section as paragraph (a), add a reference to the proposed new fee under §1.17(l) for a petition for revival where the delay which resulted in abandonment was unavoidable, and state when the showing that the delay was unavoidable must be verified. Paragraph 1.137(b) would be reserved under this Alternative (Alternative A). Proposed paragraph (c) would require that any petition for revival under paragraphs (a) of §1.137 be promptly filed and that a terminal disclaimer, equivalent to the period of abandonment of the application, be filed with any petition filed more than six months after the date of abandonment.

Section 1.155, if amended as proposed, would refer in paragraph (a) to proposed §1.18(b) which sets forth the issue fee for a design application as being $88.00. Paragraph 1.155(b), as proposed, would include a reference to the fee for delayed payment of the issue fee set forth in §1.17(l) where the delay in payment was unavoidable and state when showings that the delay was unavoidable must be verified. Paragraph 1.155(c) would be reserved under this Alternative (Alternative A). Paragraph 1.155(d) is proposed to be added to require a terminal disclaimer equivalent to the period of abandonment of the application where any petition under this section is not filed within six months of the date of abandonment.

Section 1.316 is proposed to be amended to clarify the language and to delete reference to the fee specified in the notice of allowance. Paragraph (b) is proposed to be amended to provide for petitions for revival with the fee in proposed §1.17(l) where the delay in payment was unavoidable and to state when showings

that the delay was unavoidable must be verified. Paragraph (c) would be reserved under this Alternative (Alternative A). Paragraph (d) is proposed to be added to require a terminal disclaimer equivalent to the period of abandonment of the application where any petition under this section is not filed within six months of the date of abandonment.

Alternative B - Proposed Rule Changes Under H.R. 6260

The following sections are proposed to be changed under H.R. 6260:

Section 1.9, if amended as proposed, would add new paragraphs (c) - (f) which define independent inventor, small business concern, and nonprofit organization as used in 37 CFR, Chapter I. Each of these would be identified as a "small entity" for purposes of paying fees which would be set under §41(a) and (b) of Title 35, United States Code, as amended by H.R. 6260.

H.R. 6260 would authorize the Commissioner to establish regulations defining independent inventors and nonprofit organizations. Proposed §1.9(c) would define an independent inventor as any inventor who (1) has not assigned, granted, conveyed, or licensed, and (2) is under no obligation to assign, grant, convey, or license, any rights in the invention, including (i) the right to make, use or sell the invention, and (ii) the right to exclude others from making, using, or selling the invention, to any person who could not likewise be classified as an independent inventor if that person had made the invention, or to any concern which would not qualify as a small business concern or a nonprofit organization under §1.9. Once an individual sole inventor, or one of several joint inventors, has assigned, granted, conveyed, or licensed, or comes under an obligation to assign, grant, convey, or license, any rights to the invention to anyone who could not likewise obtain status as a small entity, the inventor(s) would no longer be entitled to pay fees in the amounts established for an independent inventor (§1.9(c)). Proposed §1.9(c) would permit an individual inventor to make an assignment, grant, conveyance, or license of partial rights in the invention to another individual or individuals who could qualify as an independent inventor or inventors if they had made the invention. In addition, proposed §1.9(c) would permit an individual inventor to make an assignment, grant, conveyance, or license of partial rights in the invention to a small business concern or nonprofit organization. Under the circumstances described in the previous two sentences the individual inventor could still qualify as an independent inventor. However, if the independent inventor assigned, granted, conveyed, or licensed, or came under an obligation to assign, grant, convey, or license, any rights to the invention to any individual or organization which could not qualify as a small entity (§1.9(f)), then the inventor would no longer qualify as an independent inventor. Proposed §1.9(d) would define a small business concern by

reference to regulations established by the Small Business Administration. This requirement would be established by enactment of H.R. 6260. Proposed §1.9(e) would define a nonprofit organization by utilizing the definition contained in 35 U.S.C. 201(i). Since a nonprofit organization has already been defined in Title 35, United States Code, that definition is used in this proposal. Proposed §1.9(f) would identify an independent inventor, a small business concern or a nonprofit organization as a "small entity" for purposes of paying fees set under §41(a) and (b) of Title 35, United States Code, as amended by H.R. 6260. Fees established under §41(c) or (d) of Title 35, United States Code, would not be reduced for small entities since such a reduction is not permitted or authorized by H.R. 6260. Proposed paragraphs (c)-(f) of §1.9 should be read together with proposed new §§1.27 and 1.28 which deal with establishing status as a small entity and the effect thereof.

Section 1.16, as proposed in Alternative B, would establish in the regulations those statutory fees which would be charged by the Commissioner for filing patent applications under H.R. 6260. Section 1.16 also includes additional filing fees set in 35 U.S.C. 41(a)(1) to cover the cost of examining complexities presented by certain applications, e.g., applications containing more than a specified number of claims and any application containing a multiple dependent claim. Proposed §1.16 also provides that fees will be charged when the number of claims is increased above the specified number or when a multiple dependent claim is first presented, whether on filing or at a later point in processing.

Under 35 U.S.C. 41(a) as it would be amended by H.R. 6260, the filing fee for an original patent, except in design or plant cases, is $300. In addition, on filing or on presentation at any other time, $30 is due for each claim in independent form which is in excess of three, $10 is due for each claim (whether independent or dependent) which is in excess of twenty, and $100 is due for each application containing a multiple dependent claim. The latter fee is a one-time charge per application due the first time a multiple dependent claim is presented for examination. For the purpose of computing fees, a multiple dependent claim as referred to in §112 of Title 35, United States Code, or any claim depending therefrom, will be considered as separate dependent claims in accordance with the number of claims to which reference is made.

The fees proposed in §1.16 are reduced by 50 per centum for applications filed by independent inventors, nonprofit organizations and small business concerns in accordance with H.R. 6260. Therefore, two fees are listed under each proposed paragraph.

Proposed new §1.16 relates to application filing fees. Proposed paragraph (a) sets a basic filing fee of $300 which would be

required in all original patent applications. The term "original" as used in the regulations means "non-reissue". An "original" application could be a first filing, a division, a continuation, or a continuation-in-part application. Proposed paragraph 1.16 (b) provides for an additional fee of $30 for each independent claim in excess of 3 in an original application. Proposed new paragraph 1.16(c) would provide for an additional fee of $10 for each claim in excess of 20, whether independent or dependent. A multiple dependent claim will be considered to be that number of claims to which direct reference is made. Also, any claim which refers to a multiple dependent claim will be considered for fee calculation purposes to be the number of claims to which direct reference is made in the multiple dependent claim. Proposed paragraph 1.16(d) provides for a new fee of $100 in each application which contains one or more multiple dependent claims. The note following proposed paragraph 1.16(d) is intended to clearly indicate that the applicant, attorney, or agent may pay any additional fees required under proposed paragraphs (b), (c) and (d) of §1.16, or cancel such claims without payment of such additional fees, either at the time of filing or by the time a response is due to any notice of fee deficiency mailed by the Office. If the fees are not paid or the claims cancelled by the end of the period set for response to the notice of fee deficiency, the application would be held abandoned. Proposed new paragraph 1.16(e) would establish the amount of the surcharge for filing the basic filing fee or oath or declaration on a date later than the filing date of the application. This fee is being proposed at this time, but would only be made effective when the statutory authority for the late filing of the fee or the oath or declaration becomes effective under 35 U.S.C. 111, as it would be amended by H.R. 6260. Proposed new paragraph 1.16(f) provides for a filing fee of $125.00 for a design application.

Proposed paragraphs 1.16(g) and (h) would incorporate into the regulations the filing fees for plant and reissue applications.

Proposed paragraphs 1.16(i) and (j) would set forth the additional claim fees required in reissue applications based on claims in excess of those in the original patent.

Proposed new §1.17 relates to patent application processing fees which are normally due during the time a patent application is pending. Proposed new paragraphs (a), (b), (c) and (d) provide for the payment of an extension fee for obtaining an automatic extension of time upon filing a petition as provided for in proposed §1.136(a). The extension fee could be paid during the period for which an extension of time to respond is desired, or after the original period for response has expired, provided that any maximum statutory period which may apply has not expired. The fees set forth in proposed §1.17 are the total fees required under §1.136(a) for the periods indicated and any extension fee previously paid to extend a particular period is credited toward

the total extension fee required. Proposed paragraph (e) would set forth the fee for filing a notice of appeal to the Board of Appeals. Proposed paragraph (f) would set forth the fee for filing an appeal brief by appellant. Proposed paragraph (g) would provide for a new fee for requesting an oral hearing before the Board of Appeals. Proposed paragraphs (h) and (i) would set forth fees which would be required with petitions to the Commissioner under those sections of the regulations which specifically indicate that such petition fees are required. The amounts of the fees are set at two levels based on the degree of complexity of the petitions in order to recover the estimated average cost to the Office of processing the petitions. Proposed paragraph (j) would provide for a fee to be paid with any petition for institution of a public use proceeding to cover the estimated average cost of such a proceeding. Proposed new paragraph (k) would set forth a new fee for processing an application filed with a non-English language specification. The fee would cover the additional processing costs involved in such applications. Proposed new paragraph (l) would incorporate into the regulations the fee which would be charged for filing a petition to revive or to accept late payment of the issue fee where the delay was unavoidable. Proposed new paragraph (m) would incorporate into the regulations the fee which would be established in 35 U.S.C. 41(a) 7, as amended by H.R. 6260, to be charged for a petition for the revival of an unintentionally abandoned application for patent or for the unintentionally delayed payment of an issue fee.

Since proposed paragraphs 1.17(h), (i), (j) and (k) are proposed under the authority given the Commissioner under 35 U.S.C. 41(d) as it would be amended by H.R. 6260, only one level of fee is proposed. H.R. 6260 would only provide for the reduction of fees charged to small entities of those fees established in 35 U.S.C. 41(a) and (b).

Proposed new §1.18 would set the amount of the issue fees specified by H.R. 6260. Proposed new paragraph (a) would establish an issue fee of $500.00 for all original and reissue patents except for designs and plants. Proposed new paragraph (b) would set the amount of the issue fee for a design patent. Proposed new paragraph (c) would set forth the issue fee for a plant patent. All fees proposed in §1.18 would be reduced by 50 per centum for small entities.

Proposed new §1.20 would set fees for various post-issuance functions performed by the Office. Proposed new paragraph (a) would set forth a fee for providing a certificate of correction of an applicant's mistake. Proposed new paragraph (b) would set a fee to accompany a petition to correct inventorship in a patent under §1.324. Proposed new paragraph (c) would transfer the $1,500.00 fee for requesting reexamination from present §1.21(x) to this new section. Proposed new paragraph (d) would provide for a fee for filing a disclaimer under §1.321. Maintenance fees

required by Public Law 96-517 and which would be set in H.R. 6260 are placed in this section. Specific maintenance fees, which are required by Public Law 96-517, for those patents resulting from applications filed on and after December 12, 1980 and up to the date of enactment of H.R. 6260 are being proposed at this time in paragraphs 1.20(e)-(g). Proposed new paragraphs 1.20(h)-(j) would incorporate into the regulations the maintenance fees which would be provided in 35 U.S.C. 41(b) by H.R. 6260. The fees proposed in paragraphs 1.20(a)-(c) are only set at one level because they are proposed under 35 U.S.C. 41(d). The fees proposed in paragraphs 1.20(e)-(g) are only set at one level because they are proposed under Public Law 96-517 and are not subject to reduction for small entities. The details implementing the payment of maintenance fees are not being proposed at this time.

Proposed new §1.27 would provide in paragraph (a) that any person seeking to establish status as a small entity as defined in proposed §1.9(f) for the purpose of paying reduced fees must file a statement to that effect prior to or with the payment of such fees. Proposed paragraph 1.27(b) provides specifically for inventors filing statements claiming status as independent inventors. Proposed paragraph 1.27(c) would provide for claiming status as a small business concern. Proposed paragraph 1.27(d) would provide for claiming status as a nonprofit organization. Under proposed §1.27, as long as all of the rights remain in small entities, the fees for a small entity can be paid. This would include circumstances where the rights were divided between an independent inventor, a small business concern and a nonprofit organization or any combination thereof.

Proposed new §1.28 would provide guidance as to the effect of failure to establish, or notify the Office of any change from, small entity status. Proposed paragraph 1.28(a) would also provide that once status as a small entity has been established in an application or patent, the status remains in that application or patent without the filing of a further verified statement pursuant to §1.27, unless the status is changed. Under proposed paragraph 1.28(a), status as a small entity in one application or patent does not affect any other application or patent. Proposed paragraph 1.28(b) requires that notification of any change in status resulting in loss of entitlement to small entity status be filed in the application or patent prior to paying, or at the time of paying, any fee due after the date on which status as a small entity is no longer appropriate. Proposed paragraph 1.28(b) would also provide that the payment of any fee in an application or patent as a small entity, once small entity status has been established, would serve as a representation that such payment as a small entity is proper at the time the payment is made. Section 1.28 also would provide guidance as to the effect of improperly establishing status as a small entity. The intent of the reduced fees for small entities is to soften the impact of the fee increases under §41(a) and (b)

of Title 35, United States Code, as such sections would be amended by H.R. 6260, upon those who are least able to absorb the increased fees without overall damage to their ability to participate in the patent system through the filing, issuing and maintaining of patents. Accordingly, any attempt to improperly establish status as a small entity would be viewed as a serious matter by the Office and proposed paragraph 1.28(d) indicates that any attempt to fraudulently establish status as a small entity or pay fees as a small entity will be considered as a fraud practiced or attempted on the Office. Likewise, improperly and through gross negligence establishing status as a small entity or paying fees as a small entity will be considered as a fraud practiced or attempted on the Office. Normally, the Office will not question a claim to status as a small entity. However, if the Office must resolve such an issue in a question arising before it, the Office will look to the actual or practical status of the individual or organization claiming status as a small entity rather than the professed or apparent status.

Section 1.66, if amended as proposed, would provide for the use of an apostille of a foreign official to attest to oaths or affirmations made in foreign countries in accordance with 35 U.S.C. 115 and 261, as amended by H.R. 6260.

Section 1.137, as proposed, would designate the existing section as paragraph (a), add a reference to the proposed new fee under §1.17(l) for a petition for revival where the delay which resulted in abandonment was unavoidable, and state when the showing that the delay was unavoidable must be verified. Proposed new paragraph 1.137(b) would provide for filing a statement and a fee under proposed §1.17(m) for revival of an application which was unintentionally abandoned. Proposed paragraph (c) would require that any petition for revival under paragraphs (a) or (b) of §1.137 be promptly filed and that a terminal disclaimer, equivalent to the period of abandonment of the application, be filed with any petition filed more than six months after the date of abandonment.

Section 1.155, if amended as proposed, would refer in paragraph (a) to proposed §1.18(b) which sets forth the issue fee for a design application. Paragraph 1.155(b), as proposed, would include a reference to the fee for delayed payment of the issue fee set forth in §1.17(l) where the delay in payment was unavoidable and state when showings that the delay was unavoidable must be verified. Proposed new paragraph 1.155(c) would provide for acceptance of the late payment of the issue fee where the delay was unintentional upon petition and payment of the fee set forth in proposed §1.17(m). Paragraph 1.155(d) is proposed to be added to require a terminal disclaimer equivalent to the period of abandonment of the application where any petition under this section is not filed within six months of the date of abandonment.

Section 1.316, if amended as proposed, would implement the statutory provisions of 35 U.S.C. 41(a) with regard to petition fees for revival of applications abandoned for failure to pay the issue fee. Paragraph (b) is proposed to be amended to provide for petitions for revival with the fee in proposed §1.17(l) where the delay in payment was unavoidable and to state when showings that the delay was unavoidable must be verified. Paragraph (c) is proposed to be added to provide for petitions for revival with the fee in proposed §1.17(m) where the delay was unintentional. Paragraph (d) is proposed to be added to require a terminal disclaimer equivalent to the period of abandonment of the application where any petition under this section is not filed within six months of the date of abandonment.

Environmental, energy, and other considerations: The proposed rule change will not have a significant impact on the quality of the human environment or the conservation of energy resources.

The proposed rule change will not have a significant adverse economic impact on a substantial number of small entities (Regulatory Flexibility Act. Pub. L. 96-354) for several reasons. The fees proposed under Public Law 96-517 are set to recover 50% of patent processing costs rather than full costs and generally the rate of increase in the fees is less than that of inflation since the last increase in fees in 1965. Under H.R. 6260 and this proposed rulemaking, small entities would be able to pay reduced fees for filing, issuance, and maintenance in force of patents. In general, the rule change will also expedite proceedings before the Patent and Trademark Office, changing existing procedures where they can be simplified.

The Patent and Trademark Office has determined that this proposed rule change is not a major rule under Executive Order 12291. The annual effect on the economy will be less than $100 million. There will be no major increase in costs or prices for consumers, individual industries, Federal, State, or local government agencies, or geographic regions. There will be no significant adverse effects on competition, employment, investment, productivity, innovation, or on the ability of United States-based enterprises to compete with foreign-based enterprises in domestic or export markets.

This proposed rule change would not impose a burden under the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 et. seq., since no additional record keeping or reporting requirements are placed upon the public.

List of Subjects in 37 CFR Parts 1 and 3

Administration practice and procedure, Colleges and universities, Courts, Fraud, Inventions and patents, Lawyers, Nonprofit organizations, Small businesses.

PROPOSED AMENDMENT OF REGULATIONS

Notice is hereby given that, pursuant to the authority granted to the Commissioner of Patents and Trademarks by 35 U.S.C. 6, the Patent and Trademark Office proposes to amend Title 37 of the Code of Federal Regulations as set forth below.

It is proposed to amend 37 CFR, Parts 1 and 3, as follows with deletions indicated by brackets and additions by arrows with the exception that present §1.21 and deleted Part 3 are not shown:

PROPOSED RULE CHANGES COMMON TO PUBLIC LAW 96-517 AND H.R. 6260

1. Section 1.11 is proposed to be amended by revising paragraph (c) to read as follows:

§1.11 Files open to the public.

* * * * *

(c) All requests for reexamination for which the fee under §[1.21(x)] ▶ 1.20(c) ◀ has been paid, will be announced in the Official Gazette. Any reexaminations at the initiative of the Commissioner pursuant to §1.520 will also be announced in the Official Gazette. The announcement shall include at least the date of the request, if any, the reexamination request control number or the Commissioner initiated order control number, patent number, title, class and subclass, name of the inventor, name of the patent owner of record, and the examining group to which the reexamination is assigned.

* * * * *

2. Section 1.12 is proposed to be revised to read as follows:

1.12 Assignment records open to public inspection.

▶ (a) ◀ The assignment records, relating to original or reissue patents, including digests and indexes, ▶ and assignment records relating to pending or abandoned trademark applications and to trademark registrations, ◀ are open to public inspection and copies of any instrument recorded may be obtained upon ▶ request and ◀ payment of the fee ▶ set forth in §1.19(a)(5) ◀ [therefor].

▶ (b) ◀ Assignment records, digests, and indexes, relating to any pending or abandoned application are not available to the public. Copies of any such assignment records and information with respect thereto shall be obtainable only upon written authority of the applicant or ▶ applicant's ◀ [his] assignee or attorney or agent or upon a showing that the person seeking such information is a bona fide prospective or actual purchaser,

mortgagee, or licensee of such application, unless it shall be necessary to the proper conduct of business before the Office or as provided by these rules.

▶(c) Any request by a member of the public seeking copies of any assignment records of any pending or abandoned patent application preserved in secrecy under §1.14, or any information with respect thereto, must (1) be in the form of a petition accompanied by the petition fee set forth in §1.17(i) or (2) include written authority granting access to the member of the public to the particular assignment records from the applicant or applicant's assignee or attorney or agent of record.◀

▶(d)◀ An order for a copy of an assignment should give the identification of the record. If identified only by the name of the patentee and number of the patent, or in the case of a trademark registration by the name of the registrant and number of the registration, or by name of the applicant and serial number or international application number of the application, an extra charge ▶ as set forth in §1.21(f) ◀will be made for the time consumed in making a search for such assignment.

3. Section 1.14 is proposed to be amended by adding a new paragraph (e) to read as follows:

§1.14 Patent applications preserved in secrecy.

* * * * *

▶(e) Any request by a member of the public seeking access to, or copies of, any pending or abandoned application preserved in secrecy pursuant to paragraphs (a) and (b) of this section, or of any papers relating thereto, must (1) be in the form of a petition and be accompanied by the petition fee set forth in §1.17(i) or (2) include written authority granting access to the member of the public in that particular application from the applicant or the applicant's assignee or attorney or agent of record.◀

4. A new §1.19 is proposed to be added which reads as follows:

▶ §1.19 Document supply fees.

The Patent and Trademark Office will supply copies of the following documents upon payment of the fees indicated:

(a) Uncertified copies of Office documents

(1) Printed copy of a patent, including a design patent, or defensive publication document, except color plant patent---------- $ 1.00

(2) Printed copy of a plant patent

in color---------- $ 8.00

(3) Copy of patent application as filed, each 50 pages or fraction thereof---------- $18.00

(4) Copy of patent file wrapper and contents, each 100 pages or fraction thereof---------- $30.00

(5) Copy of Office records, except as provided in subparagraphs (3) and (4) of this paragraph, per page---------- $ 0.30

(6) Microfiche copy of microfiche, per microfiche---------- $ 2.00

(b) Certified copies of Office documents

(1) For certifying Office records, per certificate---------- $ 3.50

(2) For a search of assignment records, abstract of title and certification, per patent---------- $12.00

(3) For comparing copies not prepared by the Office with the original, prior to certification of the copies, per page---------- $ 0.10

(c) Subscription services

(1) Subscription orders for printed copies of patents as issued, annual service charge for entry of order and one subclass---------- $ 4.00

(2) For annual subscription to each additional subclass in addition to the one covered by the fee under subparagraph (1) of this paragraph, per subclass---------- $ 0.40

(d) Library service (35 U.S.C. 13)

For providing to libraries copies of all patents issued annually, per annum---------- $ 50.00

(e) Lists of patents in subclass

(1) For list of all United States patents in a subclass, per 100 patent numbers or fraction thereof---------- $ 2.00

(2) For list of United States patents in a subclass limited by date or patent number,

per 50 patent numbers or fraction thereof--------- $ 2.00. ◀

5. Section 1.21 is proposed to be revised to read as follows:

▶ §1.21 Miscellaneous fees and charges.

The Patent and Trademark Office has established the following fees for the services indicated:

(a) Registration of attorneys and agents

(1) For admission to examination for registration to practice, fee payable upon application---------- $75.00

(2) On registration to practice---------- $50.00

(3) For reinstatement to practice---------- $25.00

(4) For certificate of good standing as an attorney or agent---------- $10.00

(b) Deposit accounts

(1) For establishing or reinstating a deposit account---------- $10.00

(2) Service charge for each month when the balance at the end of the month is below $40---------- $ 2.00

(c) Disclosure document

For filing a disclosure document---------- $10.00

(d) Delivery box

Local delivery box rental, per annum---------- $24.00

(e) International-type search reports

For preparing an international-type search report of an international-type search made at the time of the first action on the merits in a national patent application---------- $25.00

(f) Search of Office records

For searching Patent and Trademark Office records for purposes not otherwise specified, per one-half hour or fraction thereof---------- $10.00

(g) Copy machine tokens

Token for copying machine, each---------- $ 0.20

(h) Recording of documents

(1) For recording each assignment, agreement or other paper relating to the property in a patent or application---------- $20.00

(2) Where a document to be recorded under subparagraph (1) of this paragraph refers to more than one patent or application, for each additional patent or application---------- $ 5.00

(i) Publication in Official Gazette

For publication in the Official Gazette of a notice of the availability of an application or a patent for licensing or sale, each application or patent---------- $ 6.00

(j) For a duplicate or replacement of a permanent Office user pass (There is no charge for the first permanent user pass).--------- $ 5.00

(k) For items and services, that the Commissioner finds may be supplied, for which fees are not specified by statute or by this section, such charges as may be determined by the Commissioner with respect to each such item or service---------- actual cost. ◀

6. Section 1.24 is proposed to be revised to read as follows:

§1.24 Coupons.

Coupons in [denominations] ▶ the denomination ◀ of [twenty cents and fifty-cents] ▶ one dollar ◀ are sold by the Patent and Trademark Office for the convenience of regular purchasers of U.S. patents[, designs,] and trademark registrations; these coupons may not be used for any other purpose. [The 20-cent coupons are sold individually and in books of 50 with stubs for record for $10.] The [50-cent] ▶ one dollar ◀ coupons are sold individually [and in pads of 10 for $5] and in books of 50 with stubs for record for [$25] ▶ $50 ◀. These coupons are good until used; they may be transferred but cannot be redeemed.

7. Section 1.25 is proposed to be revised to read as follows:

§1.25 Deposit accounts.

(a) For the convenience of attorneys, agents, and the general public ▶ in paying any fees due, ◀ in ordering services offered

by the Office, copies of records, etc., [special] deposit accounts may be established in the Patent and Trademark Office ▶ upon payment of the fee for establishing a deposit account (§1.21(b)(1)) ◀ . A minimum deposit of $50 or more, depending on the activity of the individual account, is required. At the close of each month's business, a statement will be rendered. A remittance must be made promptly upon receipt of the statement to cover the value of items or services charged to the account and thus restore the account to its established normal deposit value. An amount sufficient to cover all services, copies, etc., requested must always be on deposit. A service charge ▶ (§1.21(b)(2)) ◀ will be assessed for each month that the balance at the end of the month is below $40.

(b) Filing, issue, appeal, international-type search report, international application processing, [and] petition ▶ , and post-issuance ◀ fees may be charged against these accounts. ▶ A general authorization to charge all fees, or only certain fees, set forth in §§1.16 to 1.18 to a deposit account may be filed in an individual application, either for the entire pendency of the application or with respect to a particular paper filed. An authorization to charge to a deposit account the fee for a request for reexamination pursuant to §1.510 and any other fees required in a reexamination proceeding in a patent may also be filed with the request for reexamination. ◀

8. Section 1.26 is proposed to be revised to read as follows:

§1.26 Refunds.

(a) Money paid by actual mistake or in excess, such as a payment not required by law, will be refunded, but a mere change of purpose after the payment of money, as when a party desires to withdraw [his] ▶ an ◀ application ▶ , ◀ [or to withdraw] an appeal, ▶ or a request for oral hearing, ◀ will not entitle a party to demand such a return. Amounts of ▶ one dollar ◀ [fifty cents] or less will not be returned unless specifically demanded within a reasonable time, nor will the payer be notified of such amount; amounts over [fifty cents but less than] one dollar may be returned [in postage stamps, and other amounts] by check or, if requested, by credit to a deposit account.

(b) [Refund of a portion of any international search fee paid to the Patent and Trademark Office may be made where the prior art search made during the subsequent examination of a national application is wholly or partly based on the earlier international search made in the international application for which the search fee was paid. The amount of the refund will be as determined by the examiner according to the value of the prior international search made by the Patent and Trademark Office as an International Searching Authority, as 90 percent, 45 percent, or 0 percent of the international search fee. If the amount of the refund is not a multiple of $5, it will be rounded to the

next higher multiple of $5. (Note §1.446 for refund of the search fee in an international application.)] ▶ (Reserved) ◀

(c) If the Commissioner decides not to institute a reexamination proceeding, a refund of $1,200.00 will be made to the [requestor] ▶ requester ◀ of the proceeding. Reexamination [requestors] ▶ requesters ◀ should indicate whether any refund should be made by check or by credit to a deposit account.

9. Section 1.45 is proposed to be amended by revising paragraphs (b) and (c) to read as follows:

§1.45 Joint inventors.

* * * * *

(b) If an application for patent has been made through error and without any deceptive intention by two or more persons as joint inventors when they were not in fact joint inventors, the application may be amended to remove the names of those not inventors upon filing ▶ of a petition including ◀ a statement of the facts verified by all of the original applicants, ▶ the required fee (§1.17(h), ◀ and an oath or declaration as required by §1.65 by the applicant who is the actual inventor, provided the amendment is diligently made. Such amendment must have the written consent of any assignee.

(c) If an application for patent has been made through error and without any deceptive intention by less than all the actual joint inventors, the application may be amended to include all the joint inventors upon filing ▶ of a petition including ◀ a statement of the facts verified by, and an oath or declaration as required by §1.65 executed by, all the actual joint inventors, ▶ along with the required fee (§1.17(h), ◀ provided the amendment is diligently made. Such amendment must have the written consent of any assignee.

10. Section 1.47 is proposed to be revised to read as follows:

§1.47 Filing ▶ when an ◀ [by other than] inventor ▶ refuses to sign or cannot be reached ◀.

(a) If a joint inventor refuses to join in an application for patent or cannot be found or reached after diligent effort, the application may be made by the other inventor on behalf of himself ▶ or herself ◀ and the omitted inventor. [Such] ▶ The oath or declaration in such an ◀ application must be accompanied by ▶ a petition including ◀ proof of the pertinent facts ▶ and by the required fee (§1.17(h)) ◀ and must state the last known address of the omitted inventor. The Patent and Trademark Office shall forward notice of the filing of the application to the omitted inventor at said address. Should such notice be returned to the Office undelivered, or should the address of the omitted

inventor be unknown, notice of the filing of the application shall be published in the Official Gazette. The omitted inventor may subsequently join in the application on filing an oath or declaration of the character required by §1.65. A patent may be granted to the inventor making the application, upon a showing satisfactory to the Commissioner, subject to the same rights which the omitted inventor would have had if he ▶ or she ◀ had been joined.

(b) Whenever an inventor refuses to execute an application for patent, or cannot be found or reached after diligent effort, a person to whom the inventor has assigned or agreed in writing to assign the invention or who otherwise shows sufficient proprietary interest in the matter justifying such action may make application for patent on behalf of and as agent for the inventor. [Such] ▶ The oath or declaration in such an ◀ application must be accompanied by ▶ a petition including ◀ proof of the pertinent facts and a showing that such action is necessary to preserve the rights of the parties or to prevent irreparable damage, ▶ and by the required fee (§1.17(h)) ◀ and must state the last known address of the inventor. The assignment, written agreement to assign or other evidence of proprietary interest, or a verified copy thereof, must be filed in the Patent and Trademark Office. The Office shall forward notice of the filing of the application to the inventor at the address stated in the application. Should such notice be returned to the Office undelivered, or should the address of the inventor be unknown, notice of the filing of the application shall be published in the Official Gazette. The inventor may subsequently join in the application on filing an oath or declaration of the character required by §1.65. A patent may be granted to the inventor upon a showing satisfactory to the Commissioner.

11. Section 1.51 is proposed to be amended by revising subparagraph (a)(4) and by adding a new paragraph (c) to read as follows:

§1.51 General requisites of an application.

(a) Applications for patents must be made to the Commissioner of Patents and Trademarks. A complete application comprises:

* * *

(4) The prescribed filing fee[. (See 35 U.S.C. section 41 for filing fees.)] ▶ , see §1.16. ◀

* * * * *

▶(c) Applicants may desire and are permitted to file with, or in, the application an authorization to charge, at any time during the pendency of the application, any fees required under

any of §§1.16 to 1.18 to a deposit account established and maintained in accordance with §1.25. ◀

12. Section 1.52 is proposed to be amended by revising paragraph (a) and by adding a new paragraph (d) to read as follows:

§1.52 Language, paper, writing, margins.

(a) The application, any amendments or corrections thereto, and the oath or declaration must be in the English language except as provided for in §1.69 ▶ and paragraph (d) of this section ◀ , or be accompanied by a verified translation of the application and a translation of any corrections or amendments into the English language. All papers which are to become a part of the permanent records of the Patent and Trademark Office must be legibly written, typed, or printed in permanent ink or its equivalent in quality. All of the application papers must be presented in a form having sufficient clarity and contrast between the paper and the writing, typing, or printing thereon to permit the direct [production] ▶ reproduction ◀ of readily legible copies in any number by use of photographic, electrostatic, [photooffset] ▶ photo-offset ◀, and microfilming processes. If the papers are not of the required quality, substitute typewritten or printed papers of suitable quality may be required.

* * * * *

▶(d) An application including a signed oath or declaration may be filed in a language other than English if it is accompanied by the fee set forth in §1.17(k). A verified English translation of the non-English language application is required to be filed with the application or within such time as may be set by the Office. ◀

13. Section 1.55 is proposed to be amended by revising paragraph (b) to read as follows:

§1.55 Serial number and filing date of application.

* * * * *

(b) An applicant may claim the benefit of the filing date of a prior foreign application under the conditions specified in 35 U.S.C. 119. The claim to priority need be in no special form and may be made by the attorney or agent if the foreign application is referred to in the oath or declaration as required by §1.65. The claim for priority and the certified copy of the foreign application specified in the second paragraph of 35 U.S.C. 119 must be filed in the case of interference (§1.224); when necessary to overcome the date of a reference relied upon by the examiner; or when specifically required by the examiner; and in all other cases they must be filed not later than the date the issue fee is paid. If the papers filed are not in the English language, a translation need not be filed except in the three

particular instances specified in the preceding sentence, in which event a sworn translation or a translation certified as accurate by a sworn or official translator must be filed. ▶ If the priority papers are submitted after the date the issue fee is paid, they must be accompanied by a petition requesting their entry and the fee set forth in §1.17(i). ◀

* * * * *

14. Section 1.75 is proposed to be amended by revising paragraph (c) to read as follows:

§1.75 Claim(s).

* * * * *

(c) One or more claims may be presented in dependent form, referring back to and further limiting another claim or claims in the same application. Any dependent claim which refers to more than one other claim ("multiple dependent claim") shall refer to such other claims in the alternative only. A multiple dependent claim shall not serve as a basis for any other multiple dependent claim. For fee calculation purposes ▶ under §1.16 ◀, a multiple dependent claim will be considered to be that number of claims to which direct reference is made therein. For fee calculation purposes, also, any claim depending from a multiple dependent claim will be considered to be that number of claims to which direct reference is made in that multiple dependent claim. ▶ In addition to the other filing fees, any original application which is filed with, or is amended to include, multiple dependent claims must have paid therein the fee set forth in §1.16(d). ◀ Claims in dependent form shall be construed to include all the limitations of the claim incorporated by reference into the dependent claim. A multiple dependent claim shall be construed to incorporate by reference all the limitations of each of the particular claims in relation to which it is being considered.

* * * * *

15. Section 1.85 is proposed to be revised to read as follows:

§1.85 Informal drawings.

The requirements of §1.84 relating to drawings will be strictly enforced. A drawing not executed in conformity thereto, if suitable for reproduction, may be admitted but in such case the drawing must be corrected or a new one furnished, as required. [The necessary corrections or mounting will be made by the Office upon applicant's request or permission and at his expense. (See §§1.21 and 1.165.)]

16. Section 1.86 is proposed to be removed:

[§1.86 Draftsman to make drawings.

(a) Applicants are advised to employ competent draftsmen to make their drawings.

(b) The Office may furnish the drawings at the applicant's expense as promptly as its draftsmen can make them, for applicants who can not otherwise conveniently procure them. (See §1.21.)]

17. Section 1.102 is proposed to be amended by revising paragraph (a) and adding new paragraphs (c) and (d) to read as follows:

§1.102 Advancement of examination.

(a) Applications will not be advanced out of turn for examination or for further action except as provided by this part, or upon order of the Commissioner to expedite the business of the Office, or upon ▶ filing of a request under paragraph (b) of this section or upon filing a petition under paragraphs (c) or (d) of this section with ◀ a verified showing which, in the opinion of the Commissioner, will justify so advancing it.

* * * * *

▶(c) A petition to make an application special may be filed without a fee if the basis for the petition is the applicant's age or health or that the invention will materially enhance the quality of the environment or materially contribute to the development or conservation of energy resources.◀

▶(d) A petition to make an application special on grounds other than those referred to in paragraph (c) of this section must be accompanied by the petition fee set forth in §1.17(i).◀

18. Section 1.103 is proposed to be amended by revising paragraphs (a) and (b) to read as follows:

§1.103 Suspension of action.

(a) Suspension of action by the Office will be granted [at the request of the applicant] for good and sufficient cause and for a reasonable time specified ▶ upon petition by the applicant and, if such cause is not the fault of the Office, the payment of the fee set forth in §1.17(i). Action will not be suspended when a response by the applicant to an Office action is required ◀. [Only one suspension may be granted by the primary examiner; any further suspension must be approved by the Commissioner.]

(b) If action ▶ by the Office ◀ on an application is suspended when not requested by the applicant, the applicant shall be notified of the reasons therefor.

* * * * *

19. Section 1.104 is proposed to be amended by revising paragraph (d) to read as follows:

§1.104 Nature of examination; examiner's action.

* * * * *

(d) Any national application may also have an international-type search report prepared thereon at the time of the national examination on the merits, upon specific written request therefor and payment of the international-type search report report fee. See §1.21[(w)] ▶ (e) ◀ for amount of fee for preparation of international-type search report.

20. Section 1.134 is proposed to be added and reads as follows:

▶ §1.134 Time period for response to an Office action.

An Office action will notify the applicant of any non-statutory or shortened statutory time period set for response to an Office action. Unless the applicant is notified in writing that response is required in less than six months, a maximum period of six months is allowed. ◀

21. Section 1.135 is proposed to be amended by revising paragraphs (a), (b) and (c) to read as follows:

§1.135 Abandonment for failure to respond within time ▶ period ◀ [limit].

(a) If an applicant ▶ of a patent application ◀ fails to ▶ respond within the time period provided under §§1.134 and 1.136 ◀ [prosecute his application within six months after the date when the last official notice of any action by the Office was mailed to him, or within such shorter time as may be fixed (§1.136)], the application will become abandoned ▶ unless an Office action indicates otherwise ◀ .

(b) Prosecution of an application to save it from abandonment ▶ pursuant to paragraph (a) of this section ◀ must include such complete and proper action as the condition of the case may require. The admission of an amendment not responsive to the last official action, or refusal to admit the same, and any proceedings relative thereto, shall not operate to save the application from abandonment.

(c) When action by the applicant is a bona fide attempt to ▶ respond and to ◀ advance the case to final action, and is substantially a complete response to the [examiner's] ▶ Office ◀ action, but consideration of some matter or compliance with some requirement has been inadvertently omitted, opportunity to

explain and supply the omission may be given before the question of abandonment is considered.

* * * * *

22. Section 1.136 is proposed to be revised to read as follows:

§1.136 ▶Filing of timely responses with petition and fee for extension of time and extensions of time for cause. ◀[Time less than six months.]

(a) ▶ If an ◀ [An] applicant ▶ is ◀ [may be] required to ▶ respond within a non-statutory or shortened statutory time period, applicant may respond up to four months after the time period set if a petition for an extension of time and the fee set in §1.17 are filed prior to or with the response, unless (1) applicant is notified otherwise in an Office action or (2) the application is involved in an interference declared pursuant to §1.207. The date on which the response, the petition, and the fee have been filed is the date of the response and also the date for purposes of determining the period of extension and the corresponding amount of the fee. The expiration of the time period is determined by the amount of the fee paid. In no case may an applicant respond later than the maximum time period set by statute, or be granted an extension of time under paragraph (b) of this section when the provisions of this paragraph are available. ◀ [prosecute his application in a shorter time than six months, but not less than thirty days, whenever such shorter time is deemed necessary or expedient. Unless the applicant is notified in writing that response is required in less than six months, the maximum period of six months is allowed.]

(b) ▶When a response with petition and fee for extension of time cannot be filed pursuant to paragraph (a) of this section, the time for response ◀ [The time for reply, when a time less than six months has been set,] will be extended only for sufficient cause, and for a reasonable time specified. Any request for such extension must be filed on or before the day on which action by the applicant is due, but in no case will the mere filing of the request effect any extension. [Only one extension may be granted by the primary examiner in his discretion; any further extension must be approved by the Commissioner.] In no case can any extension carry the date on which response to an ▶Office◀ action is due beyond [six months from the date of the action.]▶ the maximum time period set by statute or be granted when the provisions of paragraph (a) of this section are available. See §1.245 for extension of time in interference proceedings.◀

23. Section 1.165 is proposed to be amended by revising paragraph (b) to read as follows:

§1.165 Drawings.

* * * * *

(b) The drawing may be in color and when color is a distinguishing characteristic of the new variety, the drawing must be in color. Two copies of color drawings must be submitted. Color drawings may be made either in permanent water color or oil, or in lieu thereof may be photographs made by color photography or properly colored on sensitized paper. Permanently mounted color photographs are acceptable. The paper in any case must correspond in size, weight and quality to the paper required for other drawings. See §1.84 [Nonpermanently mounted copies will be correctly mounted at applicant's expense, §1.21(v)].

24. Section 1.171 is proposed to be revised to read as follows:

§1.171 Application for reissue.

An application for reissue must contain the same parts required for an application for an original patent, complying with all the rules relating thereto except as otherwise provided, and in addition, must comply with the requirements of the rules relating to reissue applications. The application must be accompanied by a certified copy of an abstract of title or an order for a title report ▶ accompanied by the fee set forth in §1.19(b)(2) ◀, to be placed in the file, and by an offer to surrender the original patent (§1.178).

25. Section 1.177 is proposed to be revised to read as follows:

§1.177 Reissue in divisions.

The Commissioner may, in his ▶ or her ◀ discretion, cause several patents to be issued for distinct and separate parts of the thing patented, upon demand of the applicant, and upon payment of the required fee for each division. Each division of a reissue constitutes the subject of a separate specification descriptive of the part or parts of the invention claimed in such division; and the drawing may represent only such part or parts, subject to the provisions of §§1.83 and 1.84. On filing divisional reissue applications, they shall be referred to the Commissioner. Unless otherwise ordered by the Commissioner ▶ upon petition and payment of the fee set forth in §1.17(i) ◀, all the divisions of a reissue will issue simultaneously; if there be any controversy as to one division, the others will be withheld from issue until the controversy is ended, unless the Commissioner shall otherwise order.

26. Section 1.181 is proposed to be amended by revising paragraphs (d) and (g) to read as follows:

§1.181 Petition to the Commissioner.

* * * * *

(d) ▶ Where a ◀ [No] fee is required for a petition to the Commissioner ▶ the appropriate section of this part will so indicate ◀ [except in the case of a petition to revive an abandoned application (§1.137) or for the delayed payment of an issue fee (§1.317)]. ▶ If any required fee does not accompany the petition, the petition will be dismissed. ◀

* * * * *

(g) The Commissioner may delegate to appropriate Patent and Trademark Office officials the determination of petitions [under this section, with the exception of petitions under §1.183].

27. Section 1.182 is proposed to be revised to read as follows:

§1.182 Questions not specifically provided for.

All cases not specifically provided for in the regulations of this part will be decided in accordance with the merits of each case by or under the authority of the Commissioner, and such decision will be communicated to the interested parties in writing. ▶ Any petition seeking a decision under this section must be accompanied by the petition fee set forth in §1.17(h). ◀

28. Section 1.183 is proposed to be revised to read as follows:

§1.183 Suspension of rules.

In an extraordinary situation, when justice requires, any requirement of the regulations in this part which is not a requirement of the statutes may be suspended or waived by the Commissioner [in person] ▶ or the Commissioner's designee, sua sponte, or ◀ on petition of the interested party, subject to such other requirements as may be imposed. ▶ Any petition under this section must be accompanied by the petition fee set forth in §1.17(h). ◀

29. Section 1.191 is proposed to be amended by revising paragraph (a) to read as follows:

§1.191 Appeal to Board of Appeals.

(a) Every applicant for a patent or for reissue of a patent, or every owner of a patent under reexamination, any of the claims of which have been twice rejected, or who has been given a final rejection (§1.113), may, upon the payment of the fee ▶ set forth in §1.17(e) ◀ [required by law], appeal from the decision of the [primary] examiner to the Board of Appeals within the time allowed for response.

* * * * *

30. Section 1.192 is proposed to be amended by revising paragraph (a) to read as follows:

§1.192 Appellant's brief.

(a) The appellant shall, within 2 months from the date of the notice of appeal under §1.191 in an application, reissue application, or patent under reexamination, or within the time allowed for response to the action appealed from, if such time is later, file a brief in triplicate. The brief must be accompanied by the requisite fee ▶ set forth in §1.17(f) ◀ and must set forth the authorities and arguments on which the appellant will rely to maintain the appeal. The brief must include a concise explanation of the invention which should refer to the drawing by reference characters, and a copy of the claims involved. Appellant must also indicate at the time of filing the brief if an oral hearing is desired ▶ and submit therewith the fee set forth in §1.17(g). The time periods set forth herein are subject to the provisions of §1.136 ◀ . [Upon a showing of sufficient cause, the Commissioner may grant extensions of time for filing the brief. The determination of such requests may be delegated by the Commissioner to appropriate Patent and Trademark Office officials. All requests for extensions must be filed prior to the expiration of the period sought to be extended. The filing of a request for extension of time does not stay any period unless and until granted.]

* * * * *

31. Section 1.194 is proposed to be amended by revising paragraphs (b) and (c) to read as follows:

§1.194 Oral hearing.

* * * * *

(b) If appellant requests an oral hearing ▶ and submits therewith the fee set forth in §1.17(g) ◀ , an oral argument may be presented by, or on behalf of, the primary examiner if considered desirable by either the primary examiner or the Board.

(c) If no request ▶ and fee ◀ for oral hearing ▶ have ◀ [has] been ▶ filed ◀ [made] by the appellant, the appeal will be assigned for consideration and decision. If the appellant has requested an oral hearing ▶ and has submitted the fee set forth in §1.17(g) ◀ , a day of hearing will be set, and due notice thereof given to the appellant and to the primary examiner. Hearing will be held as stated in the notice, and oral argument will be limited to twenty minutes for the appellant and fifteen minutes for the primary examiner unless otherwise ordered before the hearing begins.

32. Section 1.197 is proposed to be amended by revising paragraph (b) to read as follows:

§1.197 Action following decision.

* * * * *

(b) ▶ A single ◀ [Any] request for rehearing or reconsideration, or modification of the decision, [must] ▶ may ◀ be ▶ made if ◀ filed within thirty days from the date of the original decision, unless that decision is so modified as to become, in effect, a new decision, and the Board of Appeals so states. Such time may be extended [by the Board of Appeals upon a showing of sufficient cause] ▶ under the provisions of §1.136 ◀.

* * * * *

33. Section 1.231 is proposed to be amended by revising paragraph (a)(1) to read as follows:

§1.231 Motions before the primary examiner.

(a) Within the period set in the notice of interference for filing motions any party to an interference may file a motion seeking:

(1) To dissolve as to one or more counts, except that such motion based on facts sought to be established by affidavits, declarations or evidence outside of official records and printed publications will not normally be considered. A motion to dissolve an interference in which a patentee is a party on the ground that the claims corresponding to the counts are unpatentable to the patentee over patents or printed publications will be considered through reexamination if it complies with the requirements of §1.510(b) and is accompanied by the fee for requesting reexamination set in § ▶ 1.20(c) ◀ [1.21(x)]. Otherwise, a motion to dissolve an interference in which a patentee is a party will not be considered if it would necessarily result in the conclusion that the claims of the patent which correspond to the counts are unpatentable to the patentee on a ground which is not ancillary to priority. Where a motion to dissolve is based on prior art, service on opposing parties must include copies of such prior art. A motion to dissolve on the ground that there is no interference in fact will not be considered unless the interference involves a design or plant patent or application or unless it relates to a count which differs from the corresponding claim of an involved patent or of one or more of the involved applications as provided in §§1.203(a) and 1.205(a).

* * *

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34. Section 1.245 is proposed to be revised to read as follows:

§1.245 Extension of time.

Extensions of time in any [case] ▶ interference proceeding ◀ not otherwise provided for may be had by stipulation of the parties, subject to approval, or on motion duly brought, sufficient cause being shown for such extension. ▶ The provisions of §1.136 do not apply to time periods in interferences. ◀

35. Section 1.246 is proposed to be revised to read as follows:

§1.246 Late papers.

A motion or other paper belatedly filed will not normally be considered except upon a showing, under oath or in the form of a declaration (§1.68), of sufficient cause as to why such motion or paper was not timely presented. ▶ The provisions of §1.136 do not apply to time periods in interferences. ◀

36. Section 1.263 is proposed to be revised to read as follows:

§1.263 Statutory disclaimer by patentee.

The disclaimer referred to in §1.262, when made by a patentee in interference is not a disclaimer under 35 U.S.C. 253. If a disclaimer under the statute ▶ and the fee set forth in §1.20(d) ◀ (see §1.321) cancelling claims involved in the interference from the patent, is made by the patentee, including all assignees as shown by the records of the Patent and Trademark Office, the interference will be dissolved pro forma as to such claims.

37. Section 1.268 is proposed to be added and to read as follows:

▶ §1.268 Filing of interference settlement agreements.

(a) Any agreement or understanding between parties to an interference, including any collateral agreements referred to therein, made in connection with or in contemplation of the termination of the interference, must be in writing and a true copy thereof filed in the Patent and Trademark Office, directed to the Board of Patent Interferences, before the termination of the interference as between the said parties to the agreement or understanding.

(b) If any party filing the agreement or understanding pursuant to paragraph (a) of this section so requests, the copy will be kept separate from the file of the interference, and made available only to Government agencies on written request, or to any person upon petition accompanied by the fee set forth in §1.17(i) and on a showing of good cause.

(c) Failure to file the copy of the agreement or understanding pursuant to paragraph (a) of this section, will render permanently unenforceable such agreement or understanding and any patent of the parties involved in the interference or any patent subsequently issued on any application of the parties so involved. The Commissioner may, however, upon petition accompanied by the fee set forth in §1.17(h) and on a showing of good cause for failure to file within the time prescribed, permit the filing of the agreement or understanding during the six-month period subsequent to the termination of the interference as between the parties to the agreement or understanding.◀

38. Section 1.292 is proposed to be amended by revising paragraph (a) to read as follows:

§1.292 Public use proceedings.

(a) When a petition for the institution of public use proceedings, supported by affidavits or declarations ▶ and the fee set forth in §1.17(j) ◀ is filed by one having information of the pendency of an application and is found, on reference to the primary examiner, to make a prima facie showing that the invention involved in an interference or claimed in an application believed to be on file had been in public use or on sale one year before the filing of the application, or before the date alleged by an interfering party in his ▶ or her ◀ preliminary statement or the date of invention established by such party, a hearing may be had before the Commissioner to determine whether a public use proceeding should be instituted. If instituted, times may be set for taking testimony, which shall be taken as provided by §§1.271 to 1.286. The petitioner will be heard in the proceedings but after decision therein will not be heard further in the prosecution of the application for patent.

* * * * *

39. Section 1.304 is proposed to be amended by revising paragraph (a) to read as follows:

§1.304 Time for appeal or civil action.

(a) The time for filing the notice and reasons of appeal to the U.S. Court of [Customs and Patent] Appeals ▶ for the Federal Circuit ◀ ([section] ▶ § ◀ 1.302) or for commencing a civil action ([section] ▶ § ◀ 1.303) is sixty days from the date of the decision of the Board of Appeals or the Board of Patent Interferences. If a request for rehearing or reconsideration, or modification of the decision, is filed within the time [specified in section] ▶ provided pursuant to § ◀ 1.197(b) or ▶ § ◀ 1.256(b), [or within any extension of time granted thereunder,] the time for filing an appeal or commencing a civil action shall expire at the end of the sixty-day period or thirty days after action on the request, whichever is later. The [sixty and thirty

day] ▶ time ◀ periods [may be extended by the Commissioner upon a showing of sufficient cause.] ▶ set forth herein are subject to the provisions of §1.136. ◀

* * * * *

40. Section 1.311 is proposed to be revised to read as follows:

§1.311 Notice of allowance.

▶(a) ◀ If, on examination, it shall appear that the applicant is entitled to a patent under the law, a notice of allowance will be sent to [him, his attorney or his agent] ▶ applicant at the correspondence address indicated in §1.33 ◀ , calling for the payment of a specified sum constituting the issue fee ▶(§1.18) ◀ , [or a portion thereof,] which shall be paid within 3 months from the date of the ▶ mailing of the ◀ notice of allowance.

▶(b) An authorization to charge the issue fee (§1.18) to a deposit account may be filed in an individual application, either before or after mailing of the notice of allowance. Where an authorization to charge the issue fee to a deposit account has been filed before the mailing of the notice of allowance, the issue fee will be automatically charged to the deposit account at the time of mailing the notice of allowance. ◀

41. Section 1.312 is proposed to be revised to read as follows:

§1.312 Amendments after allowance.

▶ (a) No amendment may be made as a matter of right in an application after the mailing of the notice of allowance. Any amendment pursuant to this paragraph filed before the payment of the issue fee may be entered ◀ [Amendments after the notice of allowance of an application will not be permitted as a matter of right. However, such amendments may be made if filed not later than the date the issue fee is paid,] on the recommendation of the primary examiner, approved by the Commissioner, without withdrawing the case from issue.

▶(b) Any amendment pursuant to paragraph (a) of this section filed after the date the issue fee is paid must be accompanied by a petition including the fee set forth in §1.17(i) and a showing of good and sufficient reasons why the amendment is necessary and was not earlier presented. ◀

42. Section 1.313 is proposed to be revised to read as follows:

§1.313 Withdrawal from issue.

(a) ▶ Applications may be withdrawn from issue for further action at the initiative of the Office or upon petition by the applicant. Any such petition by the applicant must include a

showing of good and sufficient reasons why withdrawal of the application is necessary and, if the reason for the withdrawal is not the fault of the Office, must be accompanied by the fee set forth in §1.17(i). If the application is withdrawn from issue ◀ [After the notice of allowance of an application is sent, the case will not be withdrawn from issue except by approval of the Commissioner, and if withdrawn for further action on the part of the Office], a new notice of allowance will be sent if the application is again allowed. ▶ Any amendment accompanying a petition to withdraw an application from issue must comply with the requirements of §1.312. ◀

(b) When the issue fee [or that portion thereof specified in the notice of allowance] has been paid, and the patent to be issued has received its ▶ issue ◀ date and ▶ patent ◀ number, the application will not be withdrawn from issue [on account of any mistake or change of purpose of the applicant, his attorney or his agent, nor for the purpose of enabling the inventor to procure a foreign patent, nor] for any [other reasons] ▶ reason ◀ except ▶ (1) ◀ mistake on the part of the Office, [or because of fraud] ▶ (2) a violation of §1.56 ◀ or illegality in the application, ▶ (3) unpatentability of one or more claims, ◀ or ▶ (4) ◀ for interference.

43. Section 1.314 is proposed to be revised to read as follows:

§1.314 Issuance of patent.

If payment of the issue fee [or that portion thereof specified in the notice of allowance] is timely made, the patent will issue in regular course ▶ unless (1) the application is withdrawn from issue (§1.313) or (2) issuance of the patent is deferred. Any petition by the applicant requesting deferral of the issuance of a patent must be accompanied by the fee set forth in §1.17(i) and must include a showing of good and sufficient reasons why it is necessary to defer issuance of the patent ◀ .

44. Section 1.317 is proposed to be amended by revising paragraph (a) to read as follows:

§1.317 Lapsed patents; delayed payment of balance of issue fee.

(a) ▶ If the issue fee was paid prior to October 1, 1982, any ◀ [Any] remaining balance of the issue fee is to be paid within three months from the date of notice thereof and, if not paid, the patent will lapse at the termination of the three month period.

* * * * *

45. Section 1.321 is proposed to be revised to read as follows:

§1.321 Statutory disclaimer.

(a) A disclaimer under 35 U.S.C. 253 must ▶ be accompanied by the fee set forth in §1.20(d) and ◀ identify the patent and the claim or claims which are disclaimed, and be signed by the person making the disclaimer, who shall state therein the extent of his ▶ or her ◀ interest in the patent. A disclaimer which is not a disclaimer of a complete claim or claims may be refused recordation. A notice of the disclaimer is published in the Official Gazette and attached to the printed copies of the specification. In like manner any patentee or applicant may disclaim or dedicate to the public the entire term, or any terminal part of the term, of the patent granted or to be granted.

(b) A terminal disclaimer, when filed in an application to obviate a double patenting rejection, must ▶ be accompanied by the fee set forth in §1.20(d) and ◀ include a provision that any patent granted on that application shall be enforceable only for and during such period that said patent is commonly owned with the application or patent which formed the basis for the rejection. [See §1.21 for fee.]

46. Section 1.324 is proposed to be revised to read as follows:

§1.324 Correction of [error in joining inventor] ▶ inventorship in patent ◀ .

Whenever a patent is issued and it appears that there was a misjoinder or nonjoinder of inventors and that such misjoinder or omission occurred by error and without deceptive intention, the Commissioner may, on ▶ petition ◀ [application] of all the parties and the assignees and satisfactory proof of the facts ▶ and payment of the fee set forth in §1.20(b) ◀ , or on order of a court before which such matter is called in question, issue a certificate deleting the misjoined inventor from the patent or adding the non-joined inventor to the patent.

47. Section 1.331 is proposed to be amended by revising paragraph (a) to read as follows:

§1.331 Recording of assignments.

(a) Assignments, including grants and conveyances, of patents, national applications, or international applications which designate the United States of America, will be recorded in the Patent and Trademark Office under 35 U.S.C. 261. Other instruments affecting title to a patent, a national application, or an international application which designates the United States of America, and licenses, even though the recording thereof may not serve as constructive notice under 35 U.S.C. 261, will be recorded as provided in this section or at the discretion of the Commissioner. ▶ Any instrument to be recorded, except

those under Part 7 of this title, must be accompanied by the fee set forth in §1.21(h). ◀

* * * * *

48. Section 1.332 is proposed to be revised to read as follows:

§1.332 Receipt and recording.

Assignments are recorded in regular order as promptly as possible, and then transmitted with the date and identification of the record stamped thereon to the persons entitled to them. The date of the record is the date of the receipt of the assignment at the Office in proper form and accompanied by the [full legal] fee [for recording specified in 35 U.S.C. 41(a)10.] ▶set forth in §1.21(h).◀

49. Section 1.334 is proposed to be revised to read as follows:

§1.334 Issue of patent to assignee.

▶(a)◀ In case of an assignment of the entire interest in the invention and application, or of the entire interest in the patent to be granted, the patent will normally issue to the assignee. If the assignee should hold an undivided part interest, the patent will normally issue jointly to the inventor and the assignee. If it is desired that the patent so issue ▶,◀ the assignment in either case must first have been recorded, and at a day not later than the date payment is made of the issue fee [or portion thereof specified in the notice of allowance].

▶(b)◀ At the time of payment of the issue fee, a statement must be furnished indicating whether or not an assignment has been filed with the Patent and Trademark Office. In the event an assignment has been filed, such statement must include the name ▶ and address ◀ of the assignee and indicate whether or not an acknowledgement of a recorded assignment has been received from the Patent and Trademark Office.

▶(c) If the assignment is recorded after the date of payment of the issue fee, the assignee may petition that the patent issue to the assignee as recorded. Any such petition must be accompanied by the fee set forth in §1.17(i).◀

50. Section 1.341 is proposed to be amended by revising paragraph (h) to read as follows:

§1.341 Registration of attorneys and agents.

* * * * *

(h) Oath and registration fee. Before his ▶ or her ◀ name may be entered on the register of attorneys or on the register of agents, every applicant for registration must, after his ▶ or her ◀ application is approved, subscribe and swear to an oath or make a declaration prescribed by the Commissioner of Patents and Trademarks and pay the prescribed registration fee. (See §1.21[(h)] ▶ (a)(2) ◀ .)

* * * * *

51. Section 1.347 is proposed to be revised to read as follows:

§1.347 Removing names from registers.

Attorneys and agents, registered to practice before the Patent and Trademark Office, should notify the Office of any change of address for entry on the register, by letter separate from any notice of change of address filed in individual applications. The Office may address a letter to any person on the registers, at the address of which separate notice for the register was last received, for the purpose of ascertaining whether such person desires to remain on the register. The name of any person failing to reply and give the information requested within a time limit specified will be removed from the register, and the names so removed published in the Official Gazette. Any name so removed may be reinstated, either on the register of attorneys or the register of agents, as may be appropriate. ▶ Any request for reinstatement must be accompanied by the fee set forth in §1.21(a)(3). ◀

52. Section 1.445 is proposed to be amended by revising paragraphs (a)(1)-(4) to read as follows:

§1.445 International application filing and processing fees.

(a) The following fees and charges are established by the Patent and Trademark Office under the authority of 35 U.S.C. 376:

(1) A transmittal fee (see 35 U.S.C. 361(d) and PCT Rule 14) - [$35] ▶ $125.00 ◀ .

(2) A search fee (see 35 U.S.C. 361(d) and PCT Rule 16) - [$300] ▶ $500.00 ◀ .

(3) A supplemental search fee when required (see PCT Art. 17(3)(a) and PCT Rule 40.2) - [$200] ▶ $125.00 ◀ per additional invention.

(4) The national fee, that is, the amount set forth as the filing fee under [35 U.S.C. 41(a)(1)] ▶ §1.16(a)-(d) ◀ .

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53. Section 1.446 is proposed to be amended by deleting paragraph (b).

§1.446 Refund of international application filing and processing fees.

* * * * *

(b) [Refunds of a portion of the search fee may be made if the international search report is wholly or partly based on an earlier international or international-type search (PCT Rules 16 and 41). The amount of the refund will be as determined by the examiner according to the value of the prior international-type search or international search as 90%, 45% or 0% of the international search fee. If the amount of the refund is not a multiple of $5, it will be rounded to the next higher multiple of $5. See §1.26 for refund of a portion of the international search fee during subsequent national examination of the application.] ▶ (Reserved) ◀

* * * * *

54. Section 1.451 is proposed to be amended by revising paragraph (b) to read as follows:

§1.451 The priority claim and priority document in an international application.

* * * * *

(b) Whenever the priority of an earlier United States national application is claimed in an international application, the applicant may request in a letter of transmittal accompanying the international application upon filing with the United States Receiving Office, that the Patent and Trademark Office prepare a certified copy of the national application for transmittal to the International Bureau (PCT Art. 8 and PCT Rule 17). The fee for preparing a certified copy is stated in §[1.21(b) and 35 U.S.C. 41(11).]▶ 1.19(a)(4) and (b)(1). ◀

* * * * *

55. Section 1.510 is proposed to be amended by revising paragraph (a) to read as follows:

§1.510 Request for reexamination.

(a) Any person may, at any time during the period of enforceability of a patent, file a request for reexamination by the Patent and Trademark Office of any claim of the patent on the basis of prior art patents or printed publications cited under

§1.501. The request must be accompanied by the fee for requesting reexamination set in §[1.21(x).] ▶1.20(c). ◀

* * * * *

56. Part 3 is proposed to be removed.

ALTERNATIVE A - PROPOSED RULE CHANGES UNDER ONLY PUBLIC LAW 96-517

57. A new §1.16 is proposed to be added which reads as follows:

▶ §1.16 National application filing fees.

(a) Basic fee for filing each application for an original patent, except design or plant cases---------- $150.00

(b) In addition to the basic filing fee in an original application, for filing or later presentation of each independent claim in excess of 3---------- $ 15.00

(c) In addition to the basic filing fee in an original application, for filing or later presentation of each claim (whether independent or dependent) in excess of 20 (Note that §1.75(c) indicates how multiple dependent claims are considered for fee calculation purposes.)---------- $ 5.00

(d) In addition to the basic filing fee in an original application, if the application contains, or is amended to contain, a multiple dependent claim(s), per application------- $ 50.00

(If the additional fees required by paragraphs (b), (c) and (d) are not paid on filing or on later presentation of the claims for which the additional fees are due, they must be paid or the claims cancelled by amendment, prior to the expiration of the time period set for response by the Office in any notice of fee deficiency.)

(e) (Reserved)

(f) For filing each design application----------$ 63.00

(g) Basic fee for filing each plant application-------- $100.00

(h) Basic fee for filing each reissue application------ $150.00

(i) In addition to the basic filing fee in a reissue application, for filing or later presentation

of each independent claim which is in excess of the number of independent claims in the original patent---------- $ 15.00

(j) In addition to the basic filing fee in a reissue application, for filing or later presentation of each claim (whether independent or dependent) in excess of 20 and also in excess of the number of claims in the original patent, (Note that §1.75(c) indicates how multiple dependent claims are considered for fee purposes.)---------- $ 5.00

(Note, see §1.445 for international application filing and processing fees.).◀

58. A new §1.17 is proposed to be added which reads as follows:

▶ §1.17 Patent application processing fees.

(a) Extension fee for response within first month pursuant to §1.136(a)---------- $ 50.00

(b) Extension fee for response within second month pursuant to §1.136(a)---------- $150.00

(c) Extension fee for response within third month pursuant to §1.136(a)---------- $350.00

(d) Extension fee for response within fourth month pursuant to §1.136(a)---------- $550.00

(e) For filing a notice of appeal from the examiner to the Board of Appeals---------- $ 58.00

(f) In addition to the fee for filing a notice of appeal, for filing a brief in support of an appeal---------- $ 58.00

(g) For filing a request for an oral hearing before the Board of Appeals---------- $ 50.00

(h) For filing a petition to the Commissioner under a section of this part listed below which refers to this paragraph----------$120.00

--§1.45 - for correction of inventorship
--§1.47 - for filing by other than all the inventors
--§1.182 - for decision on questions not specifically provided for
--§1.183 - to suspend the rules
--§1.268 - for late filing of interference settlement agreement

(i) For filing a petition to the Commissioner under a section of this part listed below which refers to this paragraph----------$ 60.00

--§1.12 - for access to an assignment record
--§1.14 - for access to an application
--§1.55 - for entry of late priority papers
--§1.102 - to make application special
--§1.103 - to suspend action in application
--§1.177 - for divisional reissues to issue separately
--§1.268 - for access to interference settlement agreement
--§1.312 - for amendment after payment of issue fee
--§1.313 - to withdraw an application from issue
--§1.314 - to defer issuance of a patent
--§1.334 - for patent to issue to assignee, assignment recorded late

(j) For filing a petition to institute a public use proceeding under §1.292----------$750.00

(k) For processing an application filed with a specification in a non-English language (§1.52(d))----------$ 20.00

(l) For filing a petition (1) for the revival of an abandoned application under 35 U.S.C. 133, or (2) for delayed payment of the issue fee under 35 U.S.C. 151----------$120.00.◀

59. A new §1.18 is proposed to be added which reads as follows:

▶ §1.18 Patent issue fees.

(a) Issue fee for issuing each original or reissue patent, except a design or plant patent----------$250.00

(b) Issue fee for issuing a design patent for a 3½, 7 or 14 year term----------$ 88.00

(c) Issue fee for issuing a plant patent----------$125.00.◀

60. A new §1.20 is proposed to be added which reads as follows:

▶ §1.20 Post-issuance fees.

(a) For providing a certificate of correction of applicant's mistake (§1.323)----------$ 40.00

(b) Petition for correction of inventorship in patent (§1.324)----------$ 120.00

(c) For filing a request for reexamination

(§1.510(a))----------$1,500.00

(d) For filing each statutory disclaimer (§1.321)----------$ 50.00

(e) For maintaining an original or reissue patent, except a design patent, based on an application filed on or after December 12, 1980, in force beyond 4 years; the fee is due by three years and six months after the original grant-------- $ 200.00

(f) For maintaining an original or reissue patent, except a design patent, based on an application filed on or after December 12, 1980, in force beyond 8 years; the fee is due by seven years and six months after the original grant---------- $ 400.00

(g) For maintaining an original or reissue patent, except a design patent, based on an application filed on or after December 12, 1980, in force beyond 12 years; the fee is due by eleven years and six months after the original grant---------- $ 600.00.◀

61. Section 1.137 is proposed to be revised to read as follows:

§1.137 Revival of abandoned application.

▶ (a) ◀ An application abandoned for failure to prosecute may be revived as a pending application if it is shown to the satisfaction of the Commissioner that the delay was unavoidable. A petition to revive an abandoned application must be accompanied by a [verified] showing of the causes of the delay, by the proposed response unless it has been previously filed, and by the petition fee ▶ set forth in §1.17(l). Such showing must be a verified showing if made by a person not registered to practice before the Patent and Trademark Office ◀ .

▶ (b) (Reserved) ◀

▶ (c) Any petition filed pursuant to paragraph (a) of this section must be promptly filed after the applicant is notified of, or otherwise becomes aware of, the abandonment. Any such petition not filed within six months of the date of abandonment must be accompanied by a terminal disclaimer with fee under §1.321 dedicating to the public a terminal part of the term of any patent granted thereon equivalent to the period of abandonment of the application. ◀

62. Section 1.155 is proposed to be revised to read as follows:

§1.155 Issue and term of design patents.

(a) If, on examination, it shall appear that the applicant is entitled to a design patent under the law, a notice of allowance will be sent to ▶ the applicant, or applicant's ◀ [him, his] attorney or [his] agent, calling for the payment of ▶ the ◀ [an] issue fee ▶ (§1.18(b)) ◀ [in an appropriate amount dependent on the duration of the term desired by the applicant]. If this issue fee is not paid within 3 months of the date of the notice of allowance, the application shall be regarded as abandoned.

(b) The Commissioner may accept the [late] payment of the ▶ issue ◀ fee [specified in the notice of allowance] later than three months after the mailing of the notice ▶ of allowance ◀ as though no abandonment had ever occurred if upon petition the delay in payment is shown to have been unavoidable. The petition to accept the delayed payment must be accompanied by ▶ (1) ◀ the issue fee [or portion thereof specified in the notice of allowance], unless it has been previously submitted, ▶ (2) ◀ the fee for delayed payment ▶ (§1.17(1)) ◀ , and ▶ (3) ◀ a showing [in the form of an oath or declaration as to the causes of] ▶ that ◀ the delay ▶ was unavoidable. Such showing must be a verified showing if made by a person not registered to practice before the Patent and Trademark Office ◀ .

▶ (c) (Reserved) ◀

▶ (d) Any petition filed pursuant to paragraph (b) of this section must be promptly filed after the applicant is notified of, or otherwise becomes aware of, the abandonment. Any such petition not filed within six months of the date of abandonment must be accompanied by a terminal disclaimer with fee under §1.321 dedicating to the public a terminal part of the term of any patent granted thereon equivalent to the period of abandonment of the application. ◀

63. Section 1.316 is proposed to be revised to read as follows:

§1.316 Application abandoned for failure to pay issue fee.

(a) If the ▶ issue ◀ fee [specified in the notice of allowance] is not paid within 3 months from the date of the notice ▶ of allowance, ◀ the application will be regarded as abandoned. Such an abandoned application will not be considered as pending before the Patent and Trademark Office.

(b) The Commissioner may accept the [late] payment of the ▶ issue ◀ fee [specified in the notice of allowance] later than three months after the mailing of the notice ▶ of allowance ◀ as though no abandonment had ever occurred if upon petition the delay in payment is shown to have been unavoidable. The petition to accept the delayed payment must be accompanied by ▶ (1) ◀ the issue fee [or portion thereof specified in the notice of

allowance], unless it has been previously submitted, ▶(2)◀ the fee for delayed payment ▶(§1.17(l))◀, and ▶(3)◀ a showing [in the form of an oath or declaration as to the causes of] ▶that◀ the delay ▶was unavoidable. Such showing must be a verified showing if made by a person not registered to practice before the Patent and Trademark Office◀.

▶(c) (Reserved)◀

▶(d) Any petition filed pursuant to paragraph (b) of this section must be promptly filed after the applicant is notified of, or otherwise becomes aware of, the abandonment. Any such petition not filed within six months of the date of abandonment must be accompanied by a terminal disclaimer with fee under §1.321 dedicating to the public a terminal part of the term of any patent granted thereon equivalent to the period of abandonment of the application.◀

ALTERNATIVE B - PROPOSED RULE CHANGES UNDER H.R. 6260.

64. Section 1.9 is proposed to be amended by adding new paragraphs (c)-(f) to read as follows:

§1.9 Definitions.

* * * * *

▶(c) An independent inventor as used in this chapter means any inventor who (1) has not assigned, granted, conveyed, or licensed, and (2) is under no obligation under contract, law, or otherwise, to assign, grant, convey, or license, any rights in the invention, including (i) the right to make, use, or sell the invention, and (ii) the right to exclude others from making, using, or selling the invention, to any person who could not likewise be classified as an independent inventor if that person had made the invention, or to any concern which would not qualify as a small business concern or a nonprofit organization under this section.◀

▶(d) A small business concern as used in this chapter means any business concern which, including affiliates as defined in 13 CFR 121.3-2(a), meets the standards for a small business concern as defined in regulations established by the Small Business Administration.◀

▶(e) A nonprofit organization as used in this chapter means (1) a university or other institution of higher education; (2) an organization of the type described in section 501(c)(3) of the Internal Revenue Code of 1954 (26 U.S.C. 501(c)) and exempt from taxation under section 501(a) of the Internal Revenue Code (26 U.S.C. 501(a); or (3) any nonprofit scientific or educational organization qualified under a nonprofit organization statute of a state of this country (35 U.S.C. 201(i)).◀

▶(f) A small entity as used in this chapter means an independent inventor, a small business concern or a nonprofit organization as defined in this section.◀

65. A new §1.16 is proposed to be added which reads as follows:

▶ §1.16 National application filing fees.

(a) Basic fee for filing each application for an original patent, except design or plant cases:

By a small entity (§1.9(f))---------- $150.00
By other than a small entity---------- $300.00

(b) In addition to the basic filing fee in an original application, for filing or later presentation of each independent claim in excess of 3:

By a small entity (§1.9(f))---------- $ 15.00
By other than a small entity---------- $ 30.00

(c) In addition to the basic filing fee in an original application, for filing or later presentation of each claim (whether independent or dependent) in excess of 20 (Note that §1.75(c) indicates how multiple dependent claims are considered for fee calculation purposes.):

By a small entity (§1.9(f))---------- $ 5.00
By other than a small entity---------- $ 10.00

(d) In addition to the basic filing fee in an original application, if the application contains, or is amended to contain, a multiple dependent claim(s), per application:

By a small entity (§1.9(f))---------- $ 50.00
By other than a small entity---------- $100.00

(If the additional fees required by paragraphs (b), (c) and (d) are not paid on filing or on later presentation of the claims for which the additional fees are due, they must be paid or the claims cancelled by amendment, prior to the expiration of the time period set for response by the Office in any notice of fee deficiency.)

(e) Surcharge for filing the basic filing fee or oath or declaration on a date later than the filing date of the application:

By a small entity (§1.9(f))---------- $ 50.00
By other than a small entity---------- $100.00

(f) For filing each design application:

By a small entity (§1.9(f))---------- $ 62.50
By other than a small entity---------- $125.00

(g) Basic fee for filing each plant application:

By a small entity (§1.9(f))---------- $100.00
By other than a small entity---------- $200.00

(h) Basic fee for filing each reissue application:

By a small entity (§1.9(f))---------- $150.00
By other than a small entity---------- $300.00

(i) In addition to the basic filing fee in a reissue application, for filing or later presentation of each independent claim which is in excess of the number of independent claims in the original patent:

By a small entity (§1.9(f))---------- $ 15.00
By other than a small entity---------- $ 30.00

(j) In addition to the basic filing fee in a reissue application, for filing or later presentation of each claim (whether independent or dependent) in excess of 20 and also in excess of the number of claims in the original patent, (Note that §1.75(c) indicates how multiple dependent claims are considered for fee purposes.):

By a small entity (§1.9(f))---------- $ 5.00
By other than a small entity---------- $ 10.00

(Note, see §1.445 for international application filing and processing fees.). ◀

66. A new §1.17 is proposed to be added which reads as follows:

▶ §1.17 Patent application processing fees.

(a) Extension fee for response within first month pursuant to §1.136(a):

By a small entity (§1.9(f))---------- $ 25.00
By other than a small entity---------- $ 50.00

(b) Extension fee for response within second

month pursuant to §1.136(a):

By a small entity (§1.9(f))---------- $ 75.00
By other than a small entity---------- $150.00

(c) Extension fee for response within third month pursuant to §1.136(a):

By a small entity (§1.9(f))---------- $175.00
By other than a small entity---------- $350.00

(d) Extension fee for response within fourth month pursuant to §1.136(a):

By a small entity (§1.9(f))---------- $275.00
By other than a small entity---------- $550.00

(e) For filing a notice of appeal from the examiner to the Board of Appeals:

By a small entity (§1.9(f))---------- $ 57.50
By other than a small entity---------- $115.00

(f) In addition to the fee for filing a notice of appeal, for filing a brief in support of an appeal:

By a small entity (§1.9(f))---------- $57.50
By other than a small entity---------- $115.00

(g) For filing a request for an oral hearing before the Board of Appeals:

By a small entity (§1.9(f))---------- $ 50.00
By other than a small entity---------- $100.00

(h) For filing a petition to the Commissioner under a section of this part listed below which refers to this paragraph----------$120.00

--§1.45 - for correction of inventorship
--§1.47 - for filing by other than all the inventors
--§1.182 - for decision on questions not specifically provided for
--§1.183 - to suspend the rules
--§1.268 - for late filing of interference settlement agreement

(i) For filing a petition to the Commissioner under a section of this part listed below which refers to this paragraph----------$ 60.00

--§1.12 - for access to an assignment record
--§1.14 - for access to an application
--§1.55 - for entry of late priority papers
--§1.102 - to make application special
--§1.103 - to suspend action in application
--§1.177 - for divisional reissues to issue separately
--§1.268 - for access to interference settlement agreement
--§1.312 - for amendment after payment of issue fee
--§1.313 - to withdraw an application from issue
--§1.314 - to defer issuance of a patent
--§1.334 - for patent to issue to assignee, assignment recorded late

(j) For filing a petition to institute a public use proceeding under §1.292----------$750.00

(k) For processing an application filed with a specification in a non-English language (§1.52(d))----------$ 20.00

(l) For filing a petition (1) for the revival of an abandoned application under 35 U.S.C. 133, or (2) for delayed payment of the issue fee under 35 U.S.C. 151:

By a small entity (§1.9(f))----------$ 25.00
By other than a small entity----------$ 50.00

(m) For filing a petition (1) for revival of an unintentionally abandoned application or (2) for the unintentionally delayed payment of the fee for issuing a patent:

By a small entity (§1.9(f))----------$250.00
By other than a small entity----------$500.00. ◀

67. A new §1.18 is proposed to be added which reads as follows:

▶ §1.18 Patent issue fees.

(a) Issue fee for issuing each original or reissue patent, except a design or plant patent:

By a small entity (§1.9(f))---------- $250.00
By other than a small entity---------- $500.00.

(b) Issue fee for issuing a design patent:

By a small entity (§1.9(f))---------- $ 87.50
By other than a small entity---------- $175.00.

(c) Issue fee for issuing a plant patent:

By a small entity (§1.9(f))---------- $125.00
By other than a small entity---------- $250.00. ◀

68. A new §1.20 is proposed to be added which reads as follows:

▶ §1.20 Post-issuance fees.

(a) For providing a certificate of correction of applicant's mistake (§1.323)---------- $ 40.00

(b) Petition for correction of inventorship in patent (§1.324)---------- $ 120.00

(c) For filing a request for reexamination (§1.510(a))---------- $1,500.00

(d) For filing each statutory disclaimer (§1.321):

By a small entity (§1.9(f))---------- $ 25.00
By other than a small entity---------- $ 50.00

(e) For maintaining an original or reissue patent, except a design patent, based on an application filed on or after December 12, 1980 and before (date of enactment), in force beyond 4 years; the fee is due by three years and six months after the original grant---------- $ 200.00

(f) For maintaining an original or reissue patent, except a design patent, based on an application filed on or after December 12, 1980 and before (date of enactment), in force beyond 8 years; the fee is due by seven years and six months after the original grant---------- $ 400.00

(g) For maintaining an original or reissue patent, except a design patent, based on an application filed on or after December 12, 1980 and before (date of enactment), in force beyond 12 years; the fee is due by eleven years and six months after the original grant---------- $ 600.00

(h) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after (date of enactment), in force beyond 4 years; the fee is due by three years and six months after the original grant:

By a small entity (§1.9(f))---------- $ 200.00
By other than a small entity---------- $ 400.00

(i) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after (date of enactment), in force beyond 8 years; the fee is due by seven years and six months after the original grant:

By a small entity (§1.9(f))---------- $ 400.00
By other than a small entity---------- $ 800.00

(j) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after (date of enactment), in force beyond 12 years; the fee is due by eleven years and six months after the original grant:

By a small entity (§1.9(f))---------- $ 600.00
By other than a small entity---------- $1200.00. ◀

69. Section 1.27 is proposed to be added to read as follows:

▶§1.27 Statement of status as small entity.

(a) Any person seeking to establish status as a small entity (§1.9(f)) for purposes of paying fees in an application or a patent must file a verified statement in the application or patent prior to or with any fee paid as a small entity. Such a verified statement need only be filed once in an application or patent and remains in effect until changed.

(b) Any verified statement filed pursuant to paragraph (a) of this section on behalf of an independent inventor must be signed by the independent inventor except as provided in §§1.42, 1.43, or 1.47, and must aver that the inventor qualifies as an independent inventor in accordance with §1.9(c). Where there are joint inventors in an application, each inventor must file a verified statement establishing status as an independent inventor in order to qualify as a small entity. Where any rights have been assigned, granted, conveyed, or licensed, or there is an obligation to assign, grant, convey, or license, any rights to a small business concern, a nonprofit organization, or any other individual, a verified statement must be filed by the individual, or a person entitled to act on behalf of the small business concern or nonprofit organization averring to their status.

(c) Any verified statement filed pursuant to paragraph (a) of this section on behalf of a small business concern must (1) be signed by the person entitled to act on behalf of the concern; (2) aver that the concern qualifies as a small business concern

as defined in §1.9(d); and (3) aver that the exclusive rights to the invention have been conveyed to and remain with the concern or if the rights are not exclusive, that all other rights belong to small entities as defined in §1.9. Where the rights of the small business concern as a small entity are not exclusive, a verified statement must also be filed by the other small entities having rights averring to their status as such.

(d) Any verified statement filed pursuant to paragraph (a) of this section on behalf of a nonprofit organization must (1) be signed by the person entitled to act on behalf of the organization; (2) aver that the organization qualifies as a nonprofit organization as defined in §1.9(e) specifying under which one of §1.9(e)(1), (e)(2) or (e)(3) the organization qualifies; and (3) aver that exclusive rights to the invention have been conveyed to and remain with the organization or if the rights are not exclusive, that all other rights belong to small entities as defined in §1.9. Where the rights of the nonprofit organization as a small entity are not exclusive, a verified statement must also be filed by the other small entities having rights averring to their status as such. ◀

70. Section 1.28 is proposed to be added to read as follows:

▶§1.28 Effect on fees of failure to establish status, or change in status, as a small entity.

(a) The failure to establish status as a small entity (§§1.9(f) and 1.27) in any application prior to paying, or at the time of paying, any fee (1) precludes payment of the fee in the amount established for small entities; and (2) precludes a refund pursuant to §1.26 of any portions of fees paid prior to establishing status as a small entity. Status as a small entity is waived for any fee by the failure to establish the status prior to paying, or at the time of paying, the fee. Status as a small entity must be specifically established by a verified statement filed in each application in which the status is available and desired. Once status as a small entity has been established in an application or patent, the status remains in that application or patent without the filing of a further verified statement pursuant to §1.27 unless changed, but does not affect any other application or patent, including applications or patents which are directly or indirectly dependent upon the application or patent in which the status has been established.

(b) Once status as a small entity has been established in an application or patent, notification of any change in status resulting in loss of entitlement to small entity status must be filed in the application or patent prior to paying, or at the time of paying, any fee due after the date on which status as a small entity is no longer appropriate pursuant to §1.9. The payment of any fee in an application or patent as a small entity, once small entity status has been established, shall serve as a

representation that such payment as a small entity is proper at the time the payment is made. The notification may be signed by the applicant, any person authorized to sign on behalf of the assignee, or an attorney or agent of record or acting in a representative capacity pursuant to §1.34(a).

(c) If status as a small entity is established in good faith, and fees as a small entity are paid in good faith, in any application or patent, and it is later discovered that such status as a small entity was established in error or that through error the Office was not notified of a change in status as required by paragraph (b) of this section, the error will be excused if (1) any deficiencies between the amounts paid and the amounts due are promptly paid and (2) the payment of the deficiencies is accompanied by a verified statement explaining how the error in good faith occurred and how and when it was discovered.

(d) Any attempt to fraudulently (1) establish status as a small entity or (2) pay fees as a small entity shall be considered as a fraud practiced or attempted on the Office. Improperly and through gross negligence (1) establishing status as a small entity or (2) paying fees as a small entity shall be considered as a fraud practiced or attempted on the Office. See §§1.56(d) and 1.555. ◀

71. Section 1.66 is proposed to be revised to read as follows:

§1.66 Officers authorized to administer oaths.

(a) The oath or affirmation may be made before any person within the United States authorized by law to administer oaths [, or, when] ▶ . An oath ◀ made in a foreign country ▶ may be made ◀ [,] before any diplomatic or consular officer of the United States authorized to administer oaths, or before any officer having an official seal and authorized to administer oaths in the foreign country in which the applicant may be, whose authority shall be proved by a certificate of a diplomatic or consular officer of the United States, ▶ or by an apostille of an official designated by a foreign country which, by treaty or convention, accords like effect to apostilles of designated officials in the United States. ◀[the] ▶ The ◀oath [being] ▶ shall be ◀ attested in all cases in this and other countries, by the proper official seal of the officer before whom the oath or affirmation is made. Such oath or affirmation shall be valid as to execution if it complies with the laws of the State or country where made. When the person before whom the oath or affirmation is made in this country is not provided with a seal, his official character shall be established by competent evidence, as by a certificate from a clerk of a court of record or other proper officer having a seal.

(b) When the oath is taken before an officer in a country foreign to the United States, ▶ any accompanying ◀ [all the]

application papers, except the drawings, must be attached together ▶ with the oath ◀ and a ribbon passed one or more times through all the sheets of the application, except the drawings, and the ends of said ribbon brought together under the seal before the latter is affixed and impressed, or each sheet must be impressed with the official seal of the officer before whom the oath is taken. If the papers as filed are not properly ribboned or each sheet impressed with the seal, the case will be accepted for examination, but before it is allowed, duplicate papers, prepared in compliance with the foregoing sentence, must be filed.

72. Section 1.137 is proposed to be revised to read as follows:

§1.137 Revival of abandoned application.

▶ (a) ◀ An application abandoned for failure to prosecute may be revived as a pending application if it is shown to the satisfaction of the Commissioner that the delay was unavoidable. A petition to revive an abandoned application must be accompanied by a [verified] showing of the causes of the delay, by the proposed response unless it has been previously filed, and by the petition fee ▶ set forth in §1.17(l). Such showing must be a verified showing if made by a person not registered to practice before the Patent and Trademark Office ◀ .

▶ (b) An application unintentionally abandoned for failure to prosecute may be revived as a pending application if the delay was unintentional. A petition to revive an unintentionally abandoned application must be accompanied by (1) a statement that the abandonment was unintentional, (2) a proposed response unless it has been previously filed, and (3) a petition fee as set forth in §1.17(m). Such statement must be a verified statement if made by a person not registered to practice before the Patent and Trademark Office. The Commissioner may require additional information where there is a question whether the abandonment was unintentional. ◀

▶ (c) Any petition filed pursuant to paragraph (a) or (b) of this section must be promptly filed after the applicant is notified of, or otherwise becomes aware of, the abandonment. Any such petition not filed within six months of the date of abandonment must be accompanied by a terminal disclaimer with fee under §1.321 dedicating to the public a terminal part of the term of any patent granted thereon equivalent to the period of abandonment of the application. ◀

73. Section 1.155 is proposed to be revised to read as follows:

§1.155 Issue and term of design patents.

(a) If, on examination, it shall appear that the applicant is entitled to a design patent under the law, a notice of allowance

will be sent to ▶ the applicant, or applicant's ◀[him, his] attorney or [his] agent, calling for the payment of ▶ the ◀ [an] issue fee ▶ (§1.18(b)) ◀[in an appropriate amount dependent on the duration of the term desired by the applicant]. If this issue fee is not paid within 3 months of the date of the notice of allowance, the application shall be regarded as abandoned.

(b) The Commissioner may accept the [late] payment of the ▶ issue ◀ fee [specified in the notice of allowance] later than three months after the mailing of the notice ▶ of allowance ◀ as though no abandonment had ever occurred if upon petition the delay in payment is shown to have been unavoidable. The petition to accept the delayed payment must be accompanied by ▶ (1) ◀ the issue fee [or portion thereof specified in the notice of allowance], unless it has been previously submitted, ▶ (2) ◀ the fee for delayed payment ▶ (§1.17(l)) ◀ , and ▶ (3) ◀ a showing [in the form of an oath or declaration as to the causes of] ▶ that ◀ the delay ▶ was unavoidable. Such showing must be a verified showing if made by a person not registered to practice before the Patent and Trademark Office ◀ .

▶ (c) The Commissioner may, upon petition, accept the payment of the issue fee later than three months after the mailing of the notice of allowance as though no abandonment had ever occurred if the delay in payment was unintentional. The petition to accept the delayed payment must be accompanied by (1) the issue fee, unless it has been previously submitted, (2) the fee for unintentionally delayed payment (§1.17(m)), and (3) a statement that the delay was unintentional. Such statement must be a verified statement if made by a person not registered to practice before the Patent and Trademark Office. ◀

▶ (d) Any petition filed pursuant to paragraph (b) or (c) of this section must be promptly filed after the applicant is notified of, or otherwise becomes aware of, the abandonment. Any such petition not filed within six months of the date of abandonment must be accompanied by a terminal disclaimer with fee under §1.321 dedicating to the public a terminal part of the term of any patent granted thereon equivalent to the period of abandonment of the application. ◀

74. Section 1.316 is proposed to be revised to read as follows:

§1.316 Application abandoned for failure to pay issue fee.

(a) If the ▶ issue ◀ fee [specified in the notice of allowance] is not paid within 3 months from the date of the notice ▶ of allowance, ◀ the application will be regarded as abandoned. Such an abandoned application will not be considered as pending before the Patent and Trademark Office.

(b) The Commissioner may accept the [late] payment of the

▶issue ◀ fee [specified in the notice of allowance] later than three months after the mailing of the notice ▶ of allowance ◀ as though no abandonment had ever occurred if upon petition the delay in payment is shown to have been unavoidable. The petition to accept the delayed payment must be accompanied by ▶ (1) ◀ the issue fee [or portion thereof specified in the notice of allowance], unless it has been previously submitted, ▶(2) ◀ the fee for delayed payment ▶ (§1.17(l)) ◀, and ▶ (3) ◀ a showing [in the form of an oath or declaration as to the causes of]▶ that ◀ the delay ▶ was unavoidable. Such showing must be a verified showing if made by a person not registered to practice before the Patent and Trademark Office ◀ .

▶(c) The Commissioner may, upon petition, accept the payment of the issue fee later than three months after the mailing of the notice of allowance as though no abandonment had ever occurred if the delay in payment was unintentional. The petition to accept the delayed payment must be accompanied by (1) the issue fee, unless it has been previously submitted, (2) the fee for unintentionally delayed payment (§1.17(m)), and (3) a statement that the delay was unintentional. Such statement must be a verified statement if made by a person not registered to practice before the Patent and Trademark Office. ◀

▶(d) Any petition filed pursuant to paragraph (b) or (c) of this section must be promptly filed after the applicant is notified of, or otherwise becomes aware of, the abandonment. Any such petition not filed within six months of the date of abandonment must be accompanied by a terminal disclaimer with fee under §1.321 dedicating to the public a terminal part of the term of any patent granted thereon equivalent to the period of abandonment of the application. ◀

6/21/82
Date

Gerald J. Mossinghoff
Commissioner of Patents
and Trademarks

DEPARTMENT OF COMMERCE

Patent and Trademark Office

37 CFR Part 2

Trademark Fee Revision

AGENCY: Patent and Trademark Office, Commerce

ACTION: Proposed rulemaking.

SUMMARY: Patent and Trademark Office proposes amendments of the rules of practice in trademark cases to establish fees in amounts authorized by Public Law 96-517, or as they would be authorized under H.R. 6260.

DATES: Comments must be submitted on or before July 9, 1982. A public hearing will be held July 9, 1982, beginning at 2:00 PM. Requests to present oral testimony should be received prior to July 9, 1982.

ADDRESSES: Address written comments and requests to present oral testimony to the Commissioner of Patents and Trademarks, Washington, D.C. 20231, Attention: Miss Maude Williams. The hearing will be held in Room A of Suite 1006 on the 10th floor of Building 5, Crystal Square, located at 1755 South Jefferson Davis Highway, Arlington, Virginia. Written comments and a transcript of the hearing will be available for public inspection in Room 11E-10 of Building 3, Crystal Plaza, 2021 Jefferson Davis Highway, Arlington, Virginia.

FOR FURTHER INFORMATION CONTACT: Miss Maude Williams by telephone at (703) 557-2222 or by mail marked to her attention and addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231.

SUPPLEMENTARY INFORMATION: The proposed amendments will establish fees for the filing and processing of an application for the registration of a trademark or other mark, and for providing all other services and materials relating to trademarks and other marks.

Public Law 96-517 authorizes the Commissioner to establish fees for the filing and processing of an application for the registration of a trademark or other mark, and for providing all other services and materials relating to trademarks and other marks. Public Law 96-517 requires that by October 1, 1982, fees for the filing and processing of an application for the registration of a trademark or other mark be set to recover in the aggregate 50 percent of the estimated average cost to the Office of such processing. Also by October 1, 1982, fees for providing all other services and materials

relating to trademarks and other marks are to be set to recover the estimated average cost to the Office of performing the service or furnishing the material.

The proposed rule changes are designed to implement the fee provisions of Public Law 96-517 on October 1, 1982. However, on June 8, 1982, the House of Representatives passed H.R. 6260. This bill would amend the fee provisions to be implemented on October 1, 1982. This rule change proposal therefore is also designed to implement the fee provisions as they would be amended by H.R. 6260.

The rule change proposal is intended to obtain comments which will enable adoption of final rule changes based on Public Law 96-517 and/or H.R. 6260 without further notice of proposed rulemaking. Accordingly, comments are solicited on proposed rule changes which are common to Public Law 96-517 and H.R. 6260, as well as alternative rule changes which are specific to Public Law 96-517 (Alternative A) and to H.R. 6260 (Alternative B).

H.R. 6260 would repeal the provisions in Public Law 96-517 requiring that filing and processing fees be set to recover in the aggregate 50 percent of the estimated average cost of such processing to the Office, and that fees for providing all other services and materials relating to trademarks and other marks be set to recover the estimated average cost to the Office of performing the service or furnishing the material. Instead, in passing H.R. 6260, the House of Representatives recommended a fee schedule to the Commissioner for fiscal year 1983. The fee proposal in Alternative B adopts the House recommendation.

This rule change proposal does not include rule changes for implementing provisions of Public Law 96-517 or H.R. 6260 other than the fee provisions. Rule changes for implementing provisions other than the fee provisions will be published in a later rulemaking proposal.

The specific rules for which changes are proposed are §§2.6, 2.85, 2.101, 2.146, 2.162 and 2.167.

Proposed Rule Changes Common to
Public Law 96-517 and H.R. 6260

Paragraph (3) of §2.85 is proposed to be amended to add reference to the fee, not previously charged, for filing a §15 affidavit.

§2.101, paragraph (c) is proposed to be amended to delete the reference to a service charge which will no longer be charged for late-filed fees on oppositions.

§2.146(b) is proposed to be changed to add a fee for petitioning the Commissioner. Paragraph (f) of this section is proposed to be deleted.

§2.162, paragraph (d) is proposed to be amended to remove the reference to a service charge for late-filed fees on §8 affidavits.

§2.167, paragraph (g) is proposed to be added to establish procedures relating to the fee for affidavits under §15, 15 U.S.C. 1065, and to state the Office's action when no fee or an insufficient fee is filed.

Part 4 is proposed to be deleted to eliminate all of the trademark forms from the Code of Federal Regulations. The Patent and Trademark Office has prepared a booklet entitled "Patent and Trademark Forms Booklet" which is available from the Superintendent of Documents and includes full size copies of all of the forms in Part 4. Since the forms are not mandatory, no need is seen to retain them in the Code of Federal Regulations.

Alternative A
Proposed Rule Change only
under Public Law 96-517

§2.6 is proposed to be revised to establish the fees authorized by Public Law 96-517 for filing and processing applications for the registration of trademarks or other marks and for providing services and materials relating to trademarks or other marks.

Alternative B
Proposed Rule Change only
under H.R. 6260

§2.6 is proposed to be revised to establish the fees recommended by the House of Representatives under H.R. 6260 for filing and processing applications for the registration of trademarks or other marks and for providing services and materials relating to trademarks or other marks. The $10 fee recommended by the House for certified copies appears in paragraphs (m) and (n) as a fee of $6.50 for a copy of a registered mark showing title and/or status and a fee of $3.50 for the certificate.

## Other Considerations

The Patent and Trademark Office has determined that the proposed amendments are not major rules under Executive Order 12291. The annual effect on the economy will be less than $100 million. Although the proposed fees are higher

than current fees, the effect will be offset by a reduction in the level of taxpayer support. Competition, employment investment, productivity, innovation or the ability of United States-based enterprises to compete with foreign-based enterprises in domestic or export markets will not be adversely affected to any significant degree.

The proposed amendments will not have significant adverse economic effect on a substantial number of small entities. (Regulatory Flexibility Act, 5 U.S.C. §§601 et seq.). The application filing fee has been kept as low as possible to foster use of the Federal registration system.

The proposed amendments do not impose a reporting or record keeping burden under the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 et seq. No additional information is required from the public and no additional records are required to be maintained by the Patent and Trademark Office.

Environmental, energy, and other considerations: The proposed amendments will not have a significant impact on the quality of the human environment or the conservation of energy resources.

List of Subjects in 37 CFR Part 3

Administrative practice and procedure, Trademarks.

## Proposed Amendment of Regulations

Notice is hereby given that pursuant to the Commissioner's authority under Sections 31 and 41 of the Trademark Act of July 5, 1946, 15 U.S.C. §§1113, and 1123, the Patent and Trademark Office proposes to amend Parts 2 and 4 of Title 37 of the Code of Federal Regulations as set forth below with deletions indicated by brackets and additions by arrows, with the exception that deleted Part 4 is not shown.

It is proposed to amend 37 CFR, Parts 2 and 4 as follows:

### Proposed Rule Changes Common to Public Law 96-517 and H.R. 6260

1. Section 2.85 is proposed to be amended by revising paragraph (e) to read as follows:

§2.85 Classification schedules.

* * * * *

(e) Where the amount of the fee received on filing an appeal in connection with an application or on filing an affidavit under Section 8(a) or 8(b) ▶ or Section 15 ◀

or on an application for renewal or in connection with an opposition or petition for cancellation is sufficient for at least one class of goods or services but is less than the required amount because multiple classes in an application or registration are involved, the appeal or the affidavit or renewal application or opposition or petition for cancellation will not be refused on the ground that the amount of the fee was insufficient if the required additional amount of the fee is received in the Patent and Trademark Office within the time limit set forth in the notification of this defect by the Office, or if action is sought only for the number of classes equal to the number of fees submitted.

* * * * *

2. Section 2.101 is proposed to be amended by revising paragraph (c) to read as follows:

§2.101 Filing an opposition.

* * * * *

(c) If no fee, or a fee insufficient to cover at least one class, is filed within 30 days after publication of the mark to be opposed or within an extension of the time for filing an opposition, the opposition will not be refused if the required fee(s) [and service charge (see §2.6(g)] are filed in the Patent and Trademark Office within the time limit set forth in the notification of this defect by the Office.

* * * * *

3. Section 2.146 is proposed to be amended by revising paragraph (b) to read as follows, and by deleting paragraph (f):

§2.146 Petition to the Commissioner

* * * * *

(b) Any such petition must contain a statement of the facts involved and the point or points to be reviewed and the action requested ▶ and the requisite fee ◀ .

* * * * *

[(f) No fee is required for a petition to the Commissioner.]

4. Section 2.162 is proposed to be amended by revising paragraph (d) to read as follows:

§2.162 Requirements for affidavit or declaration during sixth year.

* * * * *

(d) Include the required fee for each class to which the affidavit or declaration pertains in the registration. If no fee, or a fee insufficient to cover at least one class, is filed before the expiration of the sixth year following the date of registration or of publication under §12(c) of the Act, the affidavit or declaration will not be refused if the required fee(s) [and service charge] (See §2.6 ([g] ▶ h ◀)) are filed in the Patent and Trademark Office within the time limit set forth in the notification of this defect by the Office. In situations where a notice of deficiency is sent because no fee, or a fee insufficient to cover at least one class, is filed, §2.85(e) may not be utilized. If insufficient fees are included to cover all classes in the registration, the particular class or classes to which the affidavit or declaration pertains should be specified.

* * * * *

5. Section 2.167 is proposed to be amended to add a paragraph (g) as follows:

§2.167 Affidavit or declaration under Section 15.

* * * * *

▶(g) Include the required fee for each class to which the affidavit or declaration pertains in the registration. If no fee, or a fee insufficient to cover at least one class, is filed at an appropriate time, the affidavit or declaration will not be refused if the required fee(s) (see §2.6(i)) are filed in the Patent and Trademark Office within the time limit set forth in the notification of this defect by the Office. In situations where a notice of deficiency is sent because no fee, or fee insufficient to cover at least one class, is filed, §2.85(e) may not be utilized. If insufficient fees are included to cover all classes in the registration, the particular class or classes to which the affidavit or declaration pertains should be specified.◀

* * * * *

6. Part 4 is proposed to be removed.

Alternative A
Proposed Rule Change Only
Under Public Law 96-517

7. Section 2.6 is proposed to be revised to read as follows:

## §2.6 Trademark fees

[In addition to the fee prescribed by statute, the] ▶ The ◀ following fees and charges are established by the Patent and Trademark Office for trademark cases:

[(a) For each printed copy of a registration with data entered of record as of date of mailing, relating to renewal, cancellation, publication under section 12(c), of the 1946 Trademark Act and affidavits or declarations under sections 8 and 15 of such act.

| | |
|---|---|
| Omitting title | $1.70 |
| Showing title | 3.70 |
| (b) For photocopies or other reproductions of records, drawings, or printed material, per page of material copied | 0.30 |
| (c) [Deleted] | |
| (d) For making drawings, when facilities are available, the cost of making the same. | |
| Rate per hour | $12.00 |
| Minimum charge per sheet | 10.00 |
| (e) For correcting drawings, the cost of making the correction: | |
| Rate per hour (including a photoprint of the uncorrected drawing) | 12.00 |
| Minimum charge | 3.00 |
| (f) For abstracts of title to each registration or application: | |
| For the search, one hour or less, and certificate | 5.00 |
| Each additional hour or fraction thereof | 2.50 |
| For each brief from the digest of assignments, of 200 words or less | 2.00 |
| Each additional 100 words or fraction thereof | .20 |
| (g) For the special service of handling late filed fees in connection with an: | |
| Affidavit or declaration under §8 | 10.00 |
| Opposition | 25.00] |

▶(a) For filing an application, per class $88.00

(b) For filing an application for renewal of a registration, per class 150.00

(c) For filing to publish a mark under §12(c), per class 50.00

(d) For issuing a new certificate of registration upon request of assignee 50.00

(e) For a certificate of correction of registrant's error 50.00

(f) For filing a disclaimer to a registration 50.00

(g) For filing an amendment to a registration ..... 50.00
(h) For filing an affidavit under §8 of the Act, per class ..... 50.00
(i) For filing an affidavit under §15 of the Act, per class ..... 50.00
(j) For petitions to the Commissioner ..... 50.00
(k) For filing petition to cancel or notice of opposition, per class ..... 100.00
(l) For ex parte appeal to the Trademark Trial and Appeal Board, per class ..... 50.00
(m) For printed copy of registered mark
Copy only ..... .40
Copy showing title and/or status ..... 6.50
(n) For certifying trademark records, per certificate ..... 3.50
(o) For photocopies or other reproductions of records, drawings, or printed material, per page of the material copied ..... .30
(p) For recording trademark assignment, per document ..... 20.00
For each mark in addition to 1 assigned in the same document ..... 5.00
(q) For abstracts of title to each registration or application, including the search ..... 12.00
(r) For special service handling of late filed fees in connection with a renewal ..... 50.00
(s) For items and services that the Commissioner finds may be supplied, for which fees are not specified, such charges as may be determined by the Commissioner with respect to each such item or service ..... actual cost ◀

Alternative B
Proposed Rule
Change Only Under H.R. 6260

8. Section 2.6 is proposed to be revised to read as follows:

§2.6 Trademark fees

[In addition to the fee prescribed by statute, the] ▶The◀ following fees and charges are established by the Patent and Trademark Office for trademark cases:

[(a) For each printed copy of a registration with data entered of record as of date of mailing, relating to renewal, cancellation, publication under section 12(c), of the 1946 Trademark Act and affidavits or declarations under sections 8 and 15 of such act.
Omitting title ..... $1.70
Showing title ..... 3.70

(b) For photocopies or other reproductions of records, drawings, or printed material, per page of material copied ..... 0.30

(c) [Deleted]

(d) For making drawings, when facilities are available, the cost of making the same.

Rate per hour ..... $12.00

Minimum charge per sheet ..... 10.00

(e) For correcting drawings, the cost of making the correction:

Rate per hour (including a photoprint of the uncorrected drawing) ..... 12.00

Minimum charge ..... 3.00

(f) For abstracts of title to each registration or application:

For the search, one hour or less, and certificate ..... 5.00

Each additional hour or fraction thereof ..... 2.50

For each brief from the digest of assignments, of 200 words or less ..... 2.00

Each additional 100 words or fraction thereof ..... .20

(g) For the special service of handling late filed fees in connection with an:

Affidavit or declaration under §8 ..... 10.00

Opposition ..... 25.00]

▶ (a) For filing an application, per class .....$175.00

(b) For filing an application for renewal of a registration, per class ..... 300.00

(c) For filing to publish a mark under §12(c), per class ..... 100.00

(d) For issuing a new certificate of registration upon request of assignee ..... 100.00

(e) For a certificate of correction of registrant's error ..... 100.00

(f) For filing a disclaimer to a registration ..... 100.00

(g) For filing an amendment to a registration ..... 100.00

(h) For filing an affidavit under §8 of the Act, per class ..... 100.00

(i) For filing an affidavit under §15 of the Act, per class ..... 100.00

(j) For petitions to the Commissioner ..... 100.00

(k) For filing petition to cancel or notice of opposition, per class ..... 200.00

(l) For ex parte appeal to the Trademark Trial and Appeal Board, per class ..... 100.00

(m) For printed copy of registered mark

Copy only ..... 1.00

Copy showing title and/or status ..... 6.50

(n) For certifying trademark records, per certificate ..... 3.50

(o) For photocopies or other reproductions of records, drawings, or printed material, per page of the material copied ..... .30

(p) For recording trademark assignment, per document ..... 100.00

For each mark in addition to 1 assigned in the same document ..... 20.00

(q) For abstracts of title to each registration or application, including the search ..... 12.00

(r) For special service handling of late filed fees in connection with a renewal ..... 100.00

(s) For items and services that the Commissioner finds may be supplied, for which fees are not specified, such charges as may be determined by the Commissioner with respect to each such item or service ..... actual cost ◀

Date: 6/21/82

Gerald J. Mossinghoff
Commissioner of Patents and Trademarks

## Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The libraries listed herein, designated as patent depository libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent months or years in some libraries to all or most of the patents issued since 1870, or earlier, in other libraries.

These patent collections are open to public use and each of the patent depository libraries, in addition, offers the publications of the patent classification system (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Depending upon the library, the patents may be available in microfilm, in bound volumes of paper copies, or in some combination of both. Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the patent depository libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

| *State* | *Name of Library* | *Telephone Contact* |
|---|---|---|
| Alabama | Birmingham Public Library | (205) 254-2555 |
| Arizona | Tempe: Science Library, Arizona State University | (602) 965-7607 |
| California | Los Angeles Public Library | (213) 626-7555 Ext. 273 |
| | Sacramento: California State Library | (916) 322-4572 |
| | Sunnyvale: Patent Information Clearinghouse* | (408) 738-5580 |
| Colorado | Denver Public Library | (303) 573-5152 Ext. 222 |
| Delaware | Newark: University of Delaware | (302) 738-2238 |
| Georgia | Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology | (404) 894-4519 |
| Illinois | Chicago Public Library | (312) 269-2865 |
| Louisiana | Baton Rouge: Troy H. Middleton Library, Louisiana State University | (504) 388-2570 |
| Massachusetts | Boston Public Library | (617) 536-5400 Ext. 265 |
| Michigan | Detroit Public Library | (313) 833-1450 |
| Minnesota | Minneapolis Public Library & Information Center | (612) 372-6552 |
| Missouri | Kansas City: Linda Hall Library | (816) 363-4600 |
| | St. Louis Public Library | (314) 241-2288 Ext. 214, 215 |
| Nebraska | Lincoln: University of Nebraska-Lincoln, Engineering Library | (402) 472-3411 |
| New Hampshire | Durham: University of New Hampshire Library | (603) 862-1777 |
| New Jersey | Newark Public Library | (201) 733-7814 |
| New York | Albany: New York State Library | (518) 474-5125 |
| | Buffalo and Erie County Public Library | (716) 856-7525 Ext. 267 |
| | New York Public Library (The Research Libraries) | (212) 930-0850 |
| North Carolina | Raleigh: D. H. Hill Library, N.C. State University | (919) 737-3280 |
| Ohio | Cincinnati & Hamilton County, Public Library of | (513) 369-6936 |
| | Cleveland Public Library | (216) 623-2870 |
| | Columbus: Ohio State University Libraries | (614) 422-6286 |
| | Toledo/Lucas County Public Library | (419) 255-7055 Ext. 212 |
| Oklahoma | Stillwater: Oklahoma State University Library | (405) 624-6546 |
| Pennsylvania | Philadelphia: Franklin Institute Library | (215) 448-1321** |
| | Pittsburgh: Carnegie Library of Pittsburgh | (412) 622-3138 |
| | University Park: Pattee Library, Pennsylvania State University | (814) 865-4861 |
| Rhode Island | Providence Public Library | (401) 521-7722 Ext. 226 |
| South Carolina | Charleston: Medical University of South Carolina | (803) 792-2372 |
| Tennessee | Memphis & Shelby County Public Library and Information Center | (901) 528-2957 |
| Texas | Dallas Public Library | (214) 748-9071 |
| | Houston: The Fondren Library, Rice University | (713) 527-8101 Ext. 2587 |
| Washington | Seattle: Engineering Library, University of Washington | (206) 543-0740 |
| Wisconsin | Madison: Kurt F. Wendt Engineering Library, University of Wisconsin | (608) 262-6845 |
| | Milwaukee Public Library | (414) 278-3043 |

*Collection organized by subject matter.

**Call only between the hours of 10:00 a.m. and 5:00 p.m.

# PATENT EXAMINING CORPS

**RENE D. TEGTMEYER, Assistant Commissioner**

**WILLIAM FELDMAN, Deputy Assistant Commissioner**

**CONDITION OF PATENT APPLICATIONS AS OF May 15, 1982**

| PATENT EXAMINING GROUPS | Actual Filing Date of Oldest New Case Awaiting Action |
|---|---|
| **CHEMICAL EXAMINING GROUPS** | |
| GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—D. E. TALBERT, Director ..... Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metallurgical Apparatus; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices. | 6-23-80 |
| GENERAL ORGANIC CHEMISTRY, GROUP 120—C. E. VAN HORN, Director ..... Heterocyclic Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides. | 1-04-80 |
| HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—J. O. THOMAS, JR., Director .... Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g., Coating; Molding; Ink; Prosthdontics; Adhesive and Abrading Compositions; Molding, Shaping, Treating Process, and Apparatus Therefor; Irradiation (Part); Bleaching; Dyeing; Leather, Fur and Textile Treating Compositions. | 3-04-81 |
| COATING, LAMINATING AND PHOTOGRAPHY, GROUP 160—S. N. ZAHARNA, Director ..... Coating: Processes, Apparatus and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; and Photography. | 4-09-81 |
| SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—R. F. WHITE, Director ..... Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes. | 2-08-81 |
| **ELECTRICAL EXAMINING GROUPS** | |
| INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—S. W. ENGLE, Director Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Horology; Acoustics; Recorders; Weighing Scales. | 4-15-81 |
| SPECIAL LAWS ADMINISTRATION, GROUP 220—KENNETH L. CAGE, Director ..... Ordnance, Firearms and Ammunition; Lubrication; Illumination; Nuclear Reactors; Acoustics, Communications, Optics; Radar; Directional Radio; Torpedoes; Seismic Exploring; Cathode Ray Tube Circuitry; Cryptography; Laser Devices; Radioactive Materials; Powder Metallurgy, Rocket Fuels; Special, Fuel, Explosive and Thermic Compositions; Thermal and Photoelectric Batteries. | 8-29-80 |
| INFORMATION TRANSMISSION, STORAGE, AND RETRIEVAL, GROUP 230—EARL LEVY, Director ..... Communications; Multiplexing Techniques; Television; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts. | 6-20-80 |
| RECEPTACLES, CLEANING, WINDING, AND MEASURING, GROUP 240—G. M. FORLENZA, Director ..... Receptacles; Bearings; Joint Packing; Conduits; Switches; Presses; Plumbing Fixtures; Textile Spinning; Cleaning; Food Treating; Agitating; Centrifugal Separating; Geometrical Instruments; Sound Recording; Image Projectors; Web Feeding; Winding and Reeling; Cable Hoists; Measuring and Testing; Indicating; Fluent Material Handling; Shaft; Impellers; Rotary Fluid Motors. | 12-07-79 |
| ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—S. S. MATTHEWS, Director ..... Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring. | 11-26-79 |
| DESIGN, GROUP 290—KENNETH L. CAGE, Director ..... Industrial Arts; Household, Personal and Fine Arts. | 6-04-80 |
| **MECHANICAL EXAMINING GROUPS** | |
| HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director ..... Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment. | 8-11-80 |
| MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—M. M. NEWMAN, Director ... Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion-Bonding, Metal Founding; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks; Fishing, Etc.; Butchering; and Books and Printed Matter. | 10-02-80 |
| AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—R. E. AEGERTER, Director ..... Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Plants; Harvesting; Earth Working and Excavating; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Information Dissemination. | 2-13-80 |
| HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—D. J. STOCKING, Director ..... Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Couplings; Gearing; Fluid Handling and Control; Lubrication. | 1-07-80 |
| GENERAL CONSTRUCTIONS, TEXTILES, MINING AND GEARING, GROUP 350—A. L. SMITH, Director ..... Building Structures; Racks; Cabinets; Closures; Supports; Furniture; Fasteners; Locks; Pipe Couplings; Joints; Miscellaneous Hardware; Textiles; Sewing Machines; Apparel; Footwear; Earth Engineering; Earth Drilling; Mining; Wells; Roads; Bridges; Tool Driving; Gearing; Machine Elements; Clutches. | 6-26-80 |

**Expiration of patents**: The patents within the range of numbers indicated below expire during May 1982, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

**Patents** ..... Numbers 3,181,175 to 3,186,003, inclusive

**Plant Patents** ..... Numbers 2,502 to 2,521 inclusive

# REISSUES

## JUNE 29, 1982

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

### Re. 30,980
### WALL SYSTEM

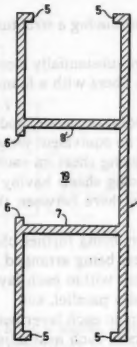
Timothy K. Potter, Trollhättan, and Raimundo Lopez Gomez, Vänersborg, both of Sweden, assignors to Gotaverken Aluminum AB, Gothenburg, Sweden

Original No. 4,223,504, dated Sep. 23, 1980, Ser. No. 928,034, Jul. 25, 1978. Application for reissue Mar. 13, 1981, Ser. No. 243,277

Claims priority, application Sweden, Aug. 1, 1977, 7708761

Int. Cl.[3] E04B *2/60*

U.S. Cl. 52—479 17 Claims



1. An interlocking frame assembly for constructing and supporting a wall system and the like, and comprising:

a plurality of substantially similarly-shaped support sections, each support section having a substantially H-shaped cross-sectional configuration defined by two pairs of oppositely directed leg members attached to one another and a web portion extending therebetween,

each pair of said oppositely directed leg members having confronting leg surfaces, with at least one pair of projections formed on each pair of confronting leg surfaces;

each pair of said H-shaped support sections further including at least one pair of parallel extending, spaced flange members attached to an outer surface of said support section and extending substantially perpendicular with respect thereto;

at least one substantially H-shaped connecting means extending between and engaging a pair of said projections formed on confronting leg surfaces of each of two perpendicularly extending support sections for interlocking said perpendicular support sections to one another, and

at least one further substantially H-shaped connecting means extending between and engaging a pair of said parallel extending, spaced flange members attached to each of two parallel extending support sections for interlocking said parallel support sections to one another.

### Re. 30,981
### TRANSMISSION DEVICES

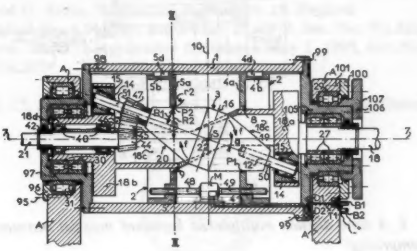
Yves Kemper, Birmingham, Mich., assignor to Vadetec Corporation, Troy, Mich.

Original No. 4,152,946, dated May 8, 1979, Ser. No. 706,291, Jul. 19, 1976. Continuation-in-part of Ser. No. 598,625, Jul. 24, 1975, abandoned. Application for reissue Jun. 13, 1979, Ser. No. 48,182

Claims priority, application Switzerland, Jul. 29, 1974, 10432/74; France, Aug. 1, 1975, 75 24130; Apr. 21, 1976, 76 11753; Jul. 12, 1976, 76 21298; Jul. 12, 1976, 76 21299

Int. Cl.[3] F16H *15/16, 15/08*

U.S. Cl. 74—193 69 Claims



41. In a transmission device having a frame, drive input means, and drive output means, means interconnecting said input and output means comprising:

a first element on a first axis fixed in the frame and having rolling surfaces of revolution about said first axis, one such rolling surface on each side of a first plane perpendicular to said first axis at a point of axes intersection;

a second element on a second axis intersecting said first axis at said point of axes intersection and having concentric journal and rolling surfaces of revolution about said second axis, the rolling surfaces of said second element being disposed one on each side of a second plane passing through said point of axes intersection and perpendicular to said second axis *said journal surfaces also being disposed one on each side of said second plane;*

support means rotatable on said first axis and journalled with said journal surfaces to support said second element *in a manner to positively establish the angle of intersection between said first and second axes and* for movement *of said second element and said second axis* in a biconical path circumferentially of said first axis, [the apex of] said biconical path [being] *having a central apex* coincident with said point of axes intersection *and diverging oppositely from said central apex at a rate of divergence established by the support of said second element from said support means;*

the respective rolling surfaces on said first and second elements being symmetrical with respect to said point of axes intersection and being in rolling frictional engagement at two points of contact in a third plane containing said first and second axes and located one on each side of said first plane;

the rolling surfaces of at least one of said elements being defined by generatrices inclined oppositely with respect to the axis of revolution thereof, thereby to provide in the respective rolling surfaces of said first and second elements a variable ratio of rolling surface radii at said points of contact for variation in the spacing of said points of contact from said first plane; and

means for forcing said respective rolling surfaces on said

first and second elements into rolling friction engagement with each other at said two points.

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Re. 30,982

## TIME SHARED TONE KEYING SYSTEM IN ELECTRONIC MUSICAL INSTRUMENT

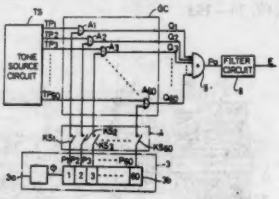
Eiichiro Aoki, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Original No. 4,108,038, dated Aug. 22, 1978, Ser. No. 671,861, Mar. 30, 1976. Application for reissue Jan. 28, 1980, Ser. No. 116,110

Claims priority, application Japan, Apr. 4, 1975, 50-41022; Apr. 8, 1975, 50-42670; Apr. 9, 1975, 50-43806

Int. Cl.³ G10H *1/02*

U.S. Cl. 84—1.19 9 Claims




*9. A time division multiplexed keyboard musical instrument, comprising:*

*a keyboard having keys each corresponding to a musical note,*

*a multiplexed tone source means for producing a time division multiplex signal having a plurality of time slots corresponding to said keyboard, each of said time slots being allocated to a corresponding individual key of said keyboard, said signal in each of those time slots corresponding to selected keys consisting of amplitude samples of a harmonic-rich tone source waveform having a note frequency designated by the individual selected key allocated to that time slot, there being no amplitude samples in the remaining time slots which correspond to non-selected keys,*

*a single format filter connected directly to receive said time division multiplex signal, said single formant filter controlling the frequency components of all of the time division multiplexed tone source waveform amplitude samples and providing as an output a musical tone signal having a predetermined tone color, and*

*an audio system receiving said musical tone signal and producing corresponding audio musical sounds therefrom.*

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Re. 30,983

## COLORIMETRIC DETERMINATION OF IRON

Lawrence L. Stookey, Ames, Iowa, assignor to Hach Chemical Company, Ames, Iowa

Original No. 3,836,331, dated Sep. 17, 1974, Ser. No. 352,734, Apr. 19, 1973. Division of Ser. No. 49,579, Jun. 24, 1970. Application for reissue Oct. 17, 1979, Ser. No. 85,500

Int. Cl.³ G01N *31/22, 33/18, 33/20*

U.S. Cl. 23—230 R 2 Claims

1. In a method for quantitatively determining the presence of iron in a sample solution which includes adding a reagent to a sample solution containing iron in the ferrous state to form a colored complex and colorimetrically determining the iron content, the improvement comprising using 3-(2-pyridyl)-5,6-bis(phenylsulfonic acid)-1,2,4 triazine as the reagent *to provide greater sensitivity as compared to that obtained with 3-(2-pyridyl)-5,6-diphenyl-1,2,4-triazine.*

Re. 30,984

## STRUCTURAL LAMINATE AND METHOD FOR MAKING SAME

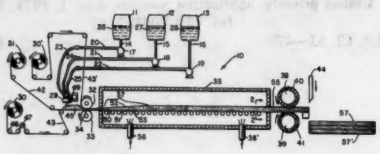
Donald E. Hipchen, Seminole; Michael Skowronski, and Joseph R. Hagan, both of Clearwater, all of Fla., assignors to The Celotex Corporation, Tampa, Fla.

Original No. 4,118,533, dated Oct. 3, 1978, Ser. No. 649,976, Jan. 19, 1976. Application for reissue Oct. 2, 1980, Ser. No. 194,184

The portion of the term of this patent subsequent to Jun. 7, 1994, has been disclaimed.

Int. Cl.³ B32B *5/20*

U.S. Cl. 428—297 63 Claims



1. A process for producing a structural laminate comprising the steps of:

I. contacting a thin, substantially incompressible yet expansible mat of glass fibers with a foam-forming mixture comprising:

A. an organic polyisocyanate, and

B. a diol having an equivalent weight between 30 and 100,

II. positioning a facing sheet on each face of the mat,

III. passing the facing sheets having the mat and the foam-forming mixture there between through the nip of two rotating rolls,

the mat of glass fibers being further characterized by

A. the glass fibers being arranged in layers,

B. the glass fibers within each layer being long, straight and substantially parallel, and

C. the glass fibers in each layer being at an acute angle to the glass fibers in each next adjacent layer, and

IV. permitting the mat of glass fibers to expand under the sole influence of the expansion of the foam-forming mixture.

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Re. 30,985

## SERUM-FREE CELL CULTURE MEDIA

Oscar A. Cartaya, 125 Pleasant St., Apt. #401, Brookline, Mass. 02146

Original No. 4,205,126, dated May 27, 1980, Ser. No. 969,590, Dec. 14, 1978. Continuation-in-part of Ser. No. 951,500, Oct. 6, 1978, abandoned, which is a continuation-in-part of Ser. No. 866,338, Jan. 1, 1978, abandoned. Application for reissue Feb. 6, 1981, Ser. No. 232,020

Int. Cl.³ A01N *1/02*

U.S. Cl. 435—240 13 Claims

1. [An MEM zinc option] *A cell culturing* medium wherein the amino acid profile is about as follows:

| Item | Amount (milligrams per liter) |
|---|---|
| L alanine | 8.9 |
| L asparagine | 75.0 |
| L aspartic acid | 13.0 |
| L glutamic acid | 14.7 |
| L glycine | 7.5 |
| L proline | 11.5 |
| L serine | 52.5 |
| L arginine HCl | 196.52 |
| L cystine | 37.2 |
| L glutamine | 584.0 |
| L histidine HCl | 65.0 |
| L isoleucine | 80.88 |
| L leucine | 160.88 |

-continued

| Item | Amount (milligrams per liter) |
|---|---|
| L lysine | 112.38 |
| L methionine | 23.30 |
| L phenyl-alanine | 50.15 |
| L threonine | 74.18 |
| L tryptophan | 15.61 |
| L valine | 71.4 |
| L tyrosine | 45.9 |

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**Re. 30,986**

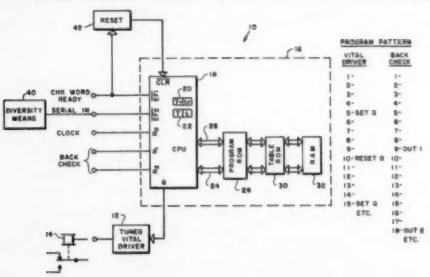
## VITAL RELAY DRIVER HAVING CONTROLLED RESPONSE TIME

**Henry C. Sibley, Adams Basin, N.Y., assignor to General Signal Corporation, Stamford, Conn.**

**Original No. 4,181,849, dated Jan. 1, 1980, Ser. No. 873,574, Jan. 30, 1978. Application for reissue Jun. 27, 1980, Ser. No. 163,759**

**Int. Cl.³ G07C *11/00***

**U.S. Cl. 235—92 T** **11 Claims**




**1**. A system for providing a signal, *based on a time cycle* to a tuned vital driver so as selectively to hold up or sustain a vital relay, which is connected to the driver, for a variety of predetermined time intervals, *corresponding to a required number of cycles*, comprising

means for selectively generating each of the predetermined time intervals, said means including a digital microprocessor having one of its outputs connected to said tuned vital driver, said microprocessor generating a dynamic signal at said one output of fixed frequency and extending for a specified time interval so long as a cycle number is being continually replenished in the microprocessor in response to the presence of a safe condition;

a diversity means connected to the input of said microprocessor for selectively supplying, in response to differing safe conditions, both a respective check word and the complement of said check word as controlling inputs of said microprocessor for developing the required number of cycles for the dynamic output signal from said processor, whereby a respective time interval is generated during which the vital relay will be sustained;

a pair of registers within said microprocessor for storing a pair of time numbers corresponding to said check word and its complement, said time numbers representing the selected time interval during which the vital relay is to be sustained;

means for continuously and repetitively decrementing the time number values in said registers;

a cycle checking means *located in said microprocessor* for continuously and repetitively checking on the programmed operations of said microprocessor.

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**Re. 30,987**

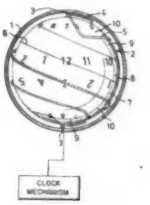
## OMNIDIRECTIONAL CLOCK

**David G. Jones, 74 Junction, London N. 19, England**

**Original No. 4,144,708, dated Mar. 20, 1979, Ser. No. 761,610, Jan. 24, 1977. Application for reissue May 5, 1980, Ser. No. 146,387**

**Int. Cl.³ G04B *19/00***

**U.S. Cl. 368—76** **12 Claims**




**1**. A clock comprising a clock face with an annular clock face surface which extends radially outwardly and axially from each end thereof toward the other end and which is thereby viewable from any radial direction and both axial directions thereof, hour and minute hands mounted coaxially with the annular clock face surface for relative rotation with respect thereto, the clock face having a plurality of at least four regularly spaced sets of time indicia each comprising a plurality of time indicia angularly spaced about the clock surface, each of said hands extending in generally spaced parallel relationship with the clock face surface between the ends thereof and extending angularly at least 360° for indicating the hour and minutes with the clock face indicia from any radial direction and both axial directions of the clock face surface, and a clock mechanism for rotating the hour and minute hands relative to the clock face.

# PLANT PATENTS

## GRANTED JUNE 29, 1982

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

**4,861**

**PEACH TREE (7-7-52)**

**Luther D. Davis, deceased, late of Davis, Calif., and by Donald R. Brooks, executor, West Sacramento, Calif., assignors to The Regents of the University of California, Berkeley, Calif.**

**Filed Oct. 20, 1980, Ser. No. 198,915**

**Int. Cl.[3] A01H** *5/03*

**U.S. Cl. Plt.—43** **1 Claim**

1. A new and distinct variety of peach tree, substantially as illustrated and described, which regularly and with high productivity bears large, uniform, globose, clingstone fruit having firm, highly flavored flesh; the fruit, which ripens approximately with the Carolyn and is similar in shape, is particularly distinctive, in comparison, by not dropping fruit before harvest, by less blush on the skin, by a stone which is eroded near the apex of the dorsal side, and by leaf glands which are reniform and not globose as are those of the Carolyn.

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**4,862**

**IMPATIENS PLANT NAMED POMO**

**John J. Ryan, 39877 Sundale Dr., Fremont, Calif. 94538**

**Filed May 16, 1980, Ser. No. 150,616**

**Int. Cl.[3] A01H** *5/00*

**U.S. Cl. Plt.—68** **1 Claim**

1. A new and distinct form of Impatiens plant as described and illustrated, known by the cultivar name Pomo.

# PATENTS

## GRANTED JUN. 29, 1982

### ERRATA

| For CLASS | See PATENT NO. |
|---|---|
| 464–111 | 4,336,696 |
| 374–138 | 4,336,712 |
| 374–197 | 4,336,713 |
| 294–087 | 4,336,898 |
| 420–472 | 4,337,089 |
| 148–402 | 4,337,090 |
| 376–210 | 4,337,118 |
| 523–128 | 4,337,181 |
| 524–609 | 4,337,182 |
| 524–446 | 4,337,183 |
| 524–726 | 4,337,184 |
| 524–458 | 4,337,185 |
| 525–362 | 4,337,186 |
| 524–504 | 4,337,187 |
| 524–140 | 4,337,188 |
| 523–332 | 4,337,189 |
| 524–599 | 4,337,190 |
| 524–599 | 4,337,191 |
| 523–212 | 4,337,192 |
| 548–451 | 4,337,200 |
| 548–413 | 4,337,201 |
| 549–314 | 4,337,202 |
| 549–396 | 4,337,203 |
| 549–465 | 4,337,204 |
| 290–001 | 4,337,399 |
| 372–013 | 4,337,442 |
| 372–049 | 4,337,443 |
| 337–167 | 4,337,447 |

# PATENTS

GRANTED JUNE 29, 1982

ERRATA

# PATENTS

## GRANTED JUNE 29, 1982

## GENERAL AND MECHANICAL

**4,336,617**

### PROSTHETIC SUBSTITUTED MEMBER FOR LIVING BODY AND A METHOD FOR THE SURGICAL TREATMENT BY USE THEREOF

**Takuji Shikita, Matsubara, and Susumu Sakaguchi, Yokohama, both of Japan, assignors to Shin-Etsu Chemical Company Limited, Tokyo, Japan and Siemens Aktiengesellschaft, Erlangen, Fed. Rep. of Germany**

**Filed Jan. 21, 1981, Ser. No. 226,704**

**Claims priority, application Japan, Jan. 21, 1980, 55-5519**

**Int. Cl.³ A61F *1/24, 5/04;* A61B *17/18***

**U.S. Cl. 3—1.9** **4 Claims**

1. A prosthetic substitute member of a structure comprising a core, an outer layer covering the core made of metallic aluminum and a surface layer on the said outer layer formed of an anodically oxidized aluminum oxide.

4. A method of surgical treatment which comprises using a prosthetic member, as a bone substitute, having a structure comprising a core, an outer layer covering the core made of metallic aluminum and a surface layer on the said outer layer formed of an anodically oxidized aluminum oxide.

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**4,336,618**

### BONE CONNECTIVE PROSTHESES ADAPTED TO MAXIMIZE STRENGTH AND DURABILITY OF PROSTHESES-BONE CEMENT INTERFACE; AND METHODS OF FORMING SAME

**Simon Raab, 5872 Westbury Ave., Montreal, Quebec H3W 2W9, Canada**

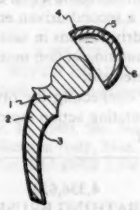
**Division of Ser. No. 45,657, Jun. 5, 1979, Pat. No. 4,281,420.**

**This application Dec. 31, 1980, Ser. No. 221,574**

**Claims priority, application United Kingdom, Feb. 15, 1979, 7905445**

**Int. Cl.³ A61F *1/04***

**U.S. Cl. 3—1.913** **56 Claims**



1. A prosthesis comprising a prosthetic element and a polymethylmethacrylate film fixedly adhered to at least a portion of the surface of said prosthetic element;

said prosthesis comprising a surface adapted to be fixedly attached to bone by means of bone cement;

said prosthetic element bearing said polymethylmethacrylate film at least upon said attachment surface;

said polymethylmethacrylate film being adhered to said prosthetic element by a process which comprises:

treating said prosthetic element surface to eliminate any weak boundary layer;

applying polymethylmethacrylate to said treated surface;

and thereafter annealing said polymethylmethacrylate film.

32. A process for preparing an improved prosthesis adapted to be joined to bone by means of bone cement which comprises:

treating said prosthetic element surface to eliminate any weak boundary layer;

applying a polymethylmethacrylate film to said treated surface;

and thereafter annealing said polymethylmethacrylate film.

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**4,336,619**

### HAND WASHER AND DRIER MOUNTING STRUCTURE

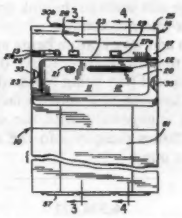
**Lester H. Hinkel, Benton Harbor, and Robert M. Chandler, St. Joseph, both of Mich., assignors to Whirlpool Corporation, Benton Harbor, Mich.**

**Continuation of Ser. No. 866,176, Dec. 30, 1977, abandoned.**

**This application Nov. 13, 1979, Ser. No. 93,905**

**Int. Cl.³ E03C *1/04, 1/32;* A47K *1/04, 10/48***

**U.S. Cl. 4—619** **12 Claims**



1. A hand washing and drying device comprising:

a bowl defining a hand washing and drying space, a backside and first and second openings;

means for supplying hand washing material to said space including a water heating tank having an outlet, said water heating tank being mounted to said backside with said outlet opening through said first bowl opening;

air moving means including a motor-driven blower, said air moving means including said blower being mounted as a unit to said backside of said bowl, said air moving means further including an outlet received in said second bowl opening to open to said space for supplying hand drying air to said space to permit sequential washing and drying of a user's hands in said space;

means for supporting the assembled bowl and mounted;

and wherein said bowl backside defines first and second mounting bosses and said air moving means is mounted to said first mounting boss and said water heating tank is mounted to said second mounting boss to form therewith an integral unitary subassembly.

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**4,336,620**

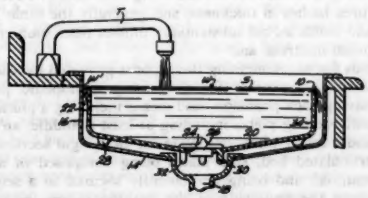
### SELF-SKIMMING DISH RINSER

**Peter P. Gresh, 389 Linwood Dr., Miami Springs, Fla. 33166**

**Filed Jul. 7, 1980, Ser. No. 166,565**

**Int. Cl.³ A47K *1/12, 4/00***

**U.S. Cl. 4—639** **1 Claim**



1. In combination, a sink having a well bounded by upstanding side walls spaced from one another a predetermined dis-

tance and being of a predetermined height and including a bottom with a central recessed drain opening; and a sink-skimming rinser sized for and received within the well, said rinser comprising a tray having a bottom and upstanding side walls of a predetermined height approximately equal to but less than the predetermined height of the sink side walls, said bottom having a drain opening to register with the sink drain opening, centering means extending downwardly from the tray bottom and received in the recessed drain opening for aligning the rinser and sink drain openings, a drain plug sized to cover and close the tray drain opening and feet means on the tray bottom spaced from the tray a predetermined distance from the sink bottom for supporting the tray bottom above the sink bottom, said centering means comprising downwardly extending finger-like projections and said tray being sized with respect to the centering means such that the walls of the tray are spaced inwardly from the walls of the sink to allow overflow water to drain past the rinser side walls and down between the sink side walls and the rinser side walls to the sink drain opening to flow between the finger-like projections;

said sink bottom and tray bottom being angled inwardly and downwardly toward their repective drain openings; and

said side walls of said tray being recessed inwardly from the side walls of the sink at a zone to facilitate lifting of the device out of engagement with the sink and pouring of matter from dishes directly into the sink such as coffee remaining in a cup.

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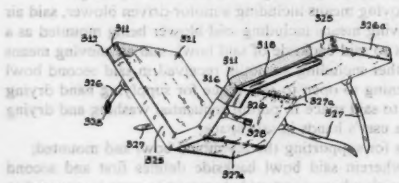
**4,336,621**

## DISPOSABLE ORTHOPEDIC OVERMATTRESS FOR ARTICULATED BEDS

**Donald R. Schwartz, 1501 S. Beverly Dr., Los Angeles, Calif. 90035, and Stuart H. Baumgard, 16031 Jeanne La., Encino, Calif. 91436**

**Filed Feb. 25, 1980, Ser. No. 124,320**
**Int. Cl.³ A61G *7/00, 7/04;* A47C *27/16***
**U.S. Cl. 5—446** **18 Claims**



1. A low-cost, light-weight disposable orthopedic overmattress, for use in conjunction with a hospital-style articulated bed having at least three rigid sections hinged together at their mutually abutting edges and having a conventional mattress disposed upon such rigid sections, said rigid sections including a stationary middle section, and movable upper and lower sections, said overmattress comprising:

continuous, compliant but firm cushion means for substantially directly supporting a person, said cushion means comprising polyurethane foam having a load deflection rating of about ILD 80, and being from about two to about three inches in thickness, and generally the same length and width as, but substantially thinner than, such conventional mattress; and

means for supplementing the support provided by said conventional mattress for supporting orthopedic patients having back problems, said means including a plurality of stiff backing plates including at least a middle, an upper and a lower plate, one plate for each rigid section of an articulated bed, said plates being composed of a rigid material, and being permanently secured in a sequence along the underside of the cushion means, each plate having generally the same width as the cushion means; the lengths of the backing plates and their positioning longitudinally along the cushion means being for functional alignment with such mutually abutting edges of such bed sections;

said middle plate being substantially the same length as the middle section of an articulated bed, each of two opposite edges of said middle plate being disposed in close proximity to one edge of said upper and lower plates, respectively, the length of each of said upper and lower plates being shorter than the corresponding upper and lower sections of said bed;

the stiffness of the backing plates and compliance of the cushion means being adapted to cooperate with a conventional mattress and rigid bed sections to attain a desired composite degree of firmness.

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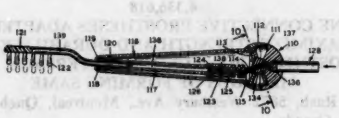
**4,336,622**

## POWER TOOTHBRUSH OR THE LIKE WITH ORBITAL BRUSH ACTION

**Walter D. Teague, Jr., Tweed Blvd., Nyack, N.Y. 10960, and Arthur T. Sempliner, 37-04 Van Nostrand Pl., Douglaston, N.Y. 11363**

**Division of Ser. No. 70,689, Aug. 29, 1979, Pat. No. 4,276,672, which is a division of Ser. No. 848,807, Nov. 7, 1977, Pat. No. 4,175,299. This application Mar. 24, 1981, Ser. No. 247,514**
**Int. Cl.³ A46B *13/06***
**U.S. Cl. 15—22 R** **4 Claims**



1. A powered toothbrush appliance or the like, which comprises

(a) a housing,

(b) a non-rotatable, orbitally movable wobble shaft mounted for universal pivoting movement in said housing,

(c) said wobble shaft including a first end supporting a working element and a second driven end,

(d) orbital output drive means in said housing comprising a fluid-powered, nutating action motor having an orbitally moving output element,

(e) means directly connecting the orbitally moving output element of the nutating action motor to the driven end of the wobble shaft.

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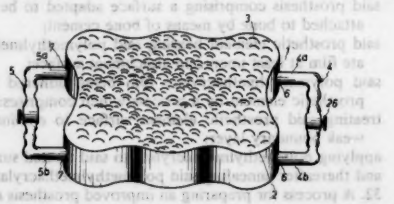
**4,336,623**

## BATHING BRUSH

**Yih-Chou Lin, No. 31, Dormitory of E. District, Veterans General Hospital, Shihpai, Taipei, Taiwan**

**Filed May 19, 1980, Ser. No. 150,747**
**Int. Cl.³ A47K *7/02***
**U.S. Cl. 15—222** **5 Claims**



1. A bathing brush comprising:

a body member containing two coil springs each contained within a cylindrical housing;

housing lids mounted on top of said housings

two pair of strings, wherein springs and retractable within the housings;
a pair of handles each connected to one set of said strings;
a sponge inner layer covering said body member; and
a velvet-like outer layer covering said sponge.

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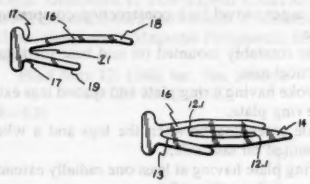
4,336,624

## SQUEEGEE ASSEMBLY

Franklin D. Pichelman, and Donald N. Mehl, both of Minnetonka, Minn., assignors to Flo-Pac Corporation, Minneapolis, Minn.

Continuation of Ser. No. 99,706, Dec. 3, 1979, abandoned. This application May 22, 1981, Ser. No. 266,508
Int. Cl.³ A47L 1/06
U.S. Cl. 15—245 2 Claims



1. A squeegee assembly comprising
(a) blade means for providing a blade edge that is not significantly susceptible to developing a wavy surface, comprising:
(i) a first substantially flexible blade member having opposite substantially parallel longitudinal tapered edges; and
(ii) a second flexible blade member substantially disposed symmetrically longitudinally around and permanently attached to said first blade member and having opposite tapered blade edges formed longitudinally thereon; and
(b) handle means for supporting said blade means.

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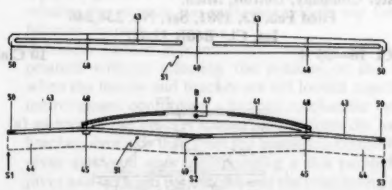
4,336,625

## WIPER BLADE

Guiseppe Maiocco, Rivoli, Italy, assignor to ARMAN S.p.A., Turin, Italy

Filed Mar. 24, 1980, Ser. No. 133,274
Claims priority, application Italy, Mar. 23, 1979, 67608 A/79
Int. Cl.³ B60S 1/04
U.S. Cl. 15—250.42 3 Claims



1. A wiper blade comprising a superstructure, a resilient wiping element and a backing strip, said backing strip having two sides embedded in two longitudinal, lateral grooves in said resilient wiping element, characterized in that said backing strip (51) changes angular direction in a plane perpendicular to the surface to be cleaned, said backing strip changes angular direction three times in such a way that the general form of the strip (51) is substantially similar to the form of an inverted and flattened W, the flexibility of said backing strip (51) diminishes in a continuous manner from its two extremities (50) to its center portion (49), and said superstructure comprises a single bridge (41) provided with claws (45), said claws gripping the backing strip (51) at the two high points of the inverted W.

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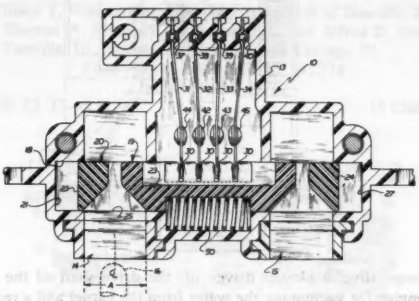
4,336,626

## CONTROLLED FORCE SAFETY SWITCH MECHANISM

Ronald D. Hone, Fairview, Tenn.; William Harris, Lakewood, Ohio, and James D. Edwards, Brentwood, Tenn., assignors to The Scott & Fetzer Company, Fairview, Tenn.

Filed Dec. 11, 1980, Ser. No. 215,232
Int. Cl.³ A47L 9/28
U.S. Cl. 15—319 4 Claims



1. A safety switch for a vacuum cleaner comprising a vacuum cleaner housing, at least two attachments adapted to be affixed to said housing, a switch casing fixed to said housing, first and second slides mounted for reciprocation in said casing relative to the casing and relative to each other, a pair of socket openings in said casing, each of said slides having a cam surface positioned in each socket opening, each cam surface sloping inwardly toward a central axis of each socket, each attachment having a probe adapted to enter one or the other of said sockets when the attachment is mounted on the cleaner, each of said probes being adapted to move said first and second slides in opposite directions a predetermined total relative distance, said first slide being adapted to operate a first plurality of switch arms, said second slide being adapted to operate a second plurality of switch arms, the switch arms comprising one of said plurality alternating with the switch arms comprising the other one of said plurality, whereby contact will be made between at least two switch arms of each plurality when a probe is inserted in one of said sockets, and whereby contact will be made between at least four switch arms of each plurality when a probe is inserted in the other socket.

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4,336,627

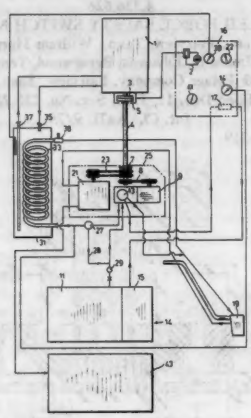
## WATER CONDITIONING SYSTEMS

Lionel D. Bascus, 2300 Finch Ave. W., Unit 22, Weston, Ontario, Canada

Filed May 19, 1980, Ser. No. 150,990
Int. Cl.³ A47L 5/12
U.S. Cl. 15—321 11 Claims

1. In a mobile carpet cleaning system operated from a van having an internal combustion engine and a drive shaft from the van engine, said system comprising a high pressure pump operated off the drive shaft, a water supply tank in the van feeding water to said high pressure pump, an immersion heat exchanger downstream of said high pressure pump and having internal passages immersed in heated coolant from the van engine, said high pressure pump driving the water through the internal passages of the heat exchanger where it is heated by the heated coolant from the van engine; a chemical tank, a pulse pump operated by pulses of the high pressure pump and injecting chemicals from the chemical tank into the heated water downstream of the heat exchanger; a cleaning wand from which the chemically treated and heated water is dispersed onto a carpet to be cleaned, an unloader valve operated

by said cleaning wand for regulating the pressure at which the water is dispersed from the cleaning wand and for bypassing water to the high pressure pump when the cleaning wand is



inoperative, a blower driven off the drive shaft of the van engine for vacuuming the water from the carpet and a recovery tank for holding the vacuumed water.

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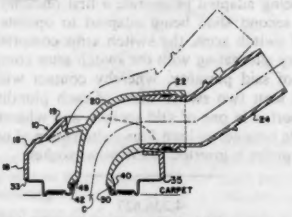
**4,336,628**

## NOZZLE WITH PIVOTED WAND

**David A. Bradshaw, and Joseph F. Oles, both of Canton, Ohio, assignors to The Hoover Company, North Canton, Ohio**

**Filed Jun. 5, 1980, Ser. No. 156,596**
**Int. Cl.³ A47L 9/06**
**U.S. Cl. 15—415 R** **6 Claims**



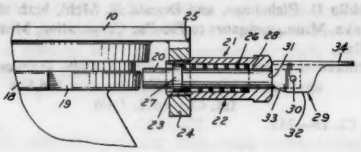

3. A pivoting nozzle and wand arrangement including;
(a) a nozzle body,
(b) a bottom plate attached to the bottom of the nozzle body,
(c) an arcuately shaped portion formed in said bottom plate,
(d) at least one arcuately shaped portion formed in said nozzle body,
(e) a wand piece disposed between said arcuately shaped portions and having surfaces cooperating with said nozzle body and bottom plate arcuate shaped portions,
(f) said arcuately shaped portions forming conforming surfaces for pivotal reception of said wand piece,
(g) said conforming arcuately shaped portions having as their center a pivot point,
(h) said pivot point being located at floor level,
(i) whereby friction induced forces generated by nozzle movement over a floor produce substantially no unbalanced moment to the nozzle.

**4,336,629**

## CASTER SWIVEL LOCK

**Grover F. Jarvis, Jr., Farmington Hills, and George E. Arold, Brownstown, both of Mich., assignors to Rose Truck and Caster Company, Detroit, Mich.**

**Filed Jan. 19, 1981, Ser. No. 226,418**
**Int. Cl.³ B60B 33/00**
**U.S. Cl. 16—35 R** **18 Claims**



1. A caster swivel lock construction comprising
a base,
a yoke rotatably mounted on said base for rotation about a vertical axis,
said yoke having a ring plate and spaced legs extending from the ring plate,
an axle extending between the legs and a wheel rotatably mounted on said axle,
said ring plate having at least one radially extending notch in the periphery thereof,
a spring loaded plunger assembly comprising a body,
a plunger movable axially in said body,
a spring associated with said plunger,
a foot pad pivoted to said plunger on the other end and having a cam portion urged by said spring to engage a portion of said body so that the plunger is moved axially inwardly and outwardly by manipulation of said foot pad,
means for removably mounting said plunger assembly on said base plate so that the plunger axis extends radially inwardly toward said ring plate and movement of said foot pad causes said plunger to move radially inwardly and outwardly for engagement and disengagement with said notch,
said cam portion having a configuration such that in one position of said foot pad, said one end of said plunger is out of engagement with said notch, and in another position, said one end of said plunger is in engagement with said notch.

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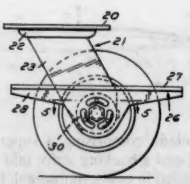
**4,336,630**

## CASTER BRAKE

**Lucille A. Page, Allen Park, Mich., assignor to Rose Truck and Caster Company, Detroit, Mich.**

**Filed Feb. 13, 1981, Ser. No. 234,246**
**Int. Cl.³ B60B 33/00**
**U.S. Cl. 16—35 R** **10 Claims**



1. A caster brake construction comprising
a base,
a yoke rotatably mounted on said base and having downwardly extending legs,
an axle extending between said legs,
a wheel rotatably mounted on said axle,
a washer on said axle exteriorly of one of said legs,

means between said one leg and said washer for preventing rotation of said washer relative to said one leg,

a pedal mounted on said axle exteriorly of said washer,

said pedal having arcuate camways at circumferentially spaced points thereof,

each camway being tapered inwardly toward the center thereof,

and a plurality of circumferentially spaced projections on said washer normally engaging the deepest portions of said camways such that when the pedal is rotated in either direction from said normal position, said camways force said projections axially inwardly thereby forcing said one leg against said wheel to lock said wheel against rotation, and when said pedal is returned to its original position, said braking force is relieved.

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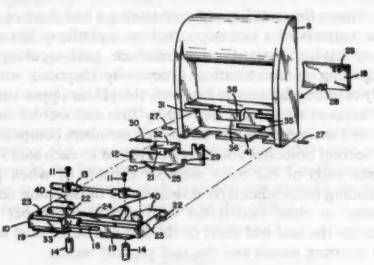
4,336,631

## HANDLE ASSEMBLY, TOP-LOAD CARTRIDGE

James A. Duff, Omaha, Nebr., and Donald R. Boisvert, Minneapolis, Minn., assignors to Magnetic Peripherals, Inc., Minneapolis, Minn.

Filed May 12, 1980, Ser. No. 138,252
Int. Cl.³ G11B *23/02*
U.S. Cl. 16—126 3 Claims



1. In a double-acting disc memory module handle of the type pivotally attached to a bracket, said bracket pivotally attached in turn to connecting rods attached to a draw plate within the disc hub,

said handle and bracket including a latch mechanism locking, by manual actuation of a spring loaded slide, the handle and bracket together when the handle and bracket are lying flat against the module top surface, and drawing the draw plate toward the module top by leverage exerted on the connecting rods while the handle and bracket are locked together and manually rotated to a raised position relative the module top with the module top forming a fulcrum support,

said handle further independently rotatable to the raised position without affecting the position of the bracket when the handle and bracket are not locked together, the improvement comprising a locking mechanism including

(a) an area of the bracket spaced farther from the handle to bracket pivot axis than from the bracket to connecting rod pivot axis, said area incorporating a slot parallel to the pivot axis between the bracket and the connecting rods, an entry port in the slot at a first end thereof extending away from the module top, the width of the entry port being greater than a predetermined width dimension; and

(b) a carrier comprising the latch mechanism shiftable parallel to the connecting rod to bracket pivot axis and carried by the handle, and having a projection extending transverse to the pivot axes and lying in the entry port, and aligned with the entrance to the slot when the bracket and the handle are lying flat against the module top, said projection having the predetermined width dimension and being less thick than the slot's width, wherein manual actuation of the latch mechanism shifts the carrier-supported projection into the slot between its second end and the entry port, and manually rotating the handle toward its raised position while the latch mechanism is actuated causes the projection to engage the side of the slot thereby causing the bracket and handle to rotate as a unit, and wherein the projection moves relatively through the entry port as the handle is rotated between its flat and raised positions with the latch mechanism not actuated.

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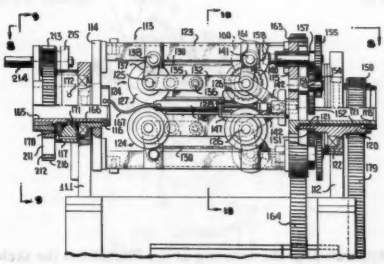
4,336,632

## CONTINUOUS SHIRRING AND SPINNING APPARATUS FOR CASINGS

Willard T. Wilson; Harold H. Martinek, both of Danville, Ill.; Thomas W. Martinek, Covington, Ind., and Alfred D. Story, Danville, Ill., assignors to Teepak, Inc., Chicago, Ill.

Filed May 8, 1980, Ser. No. 147,774
Int. Cl.³ A22C *13/02*
U.S. Cl. 17—1 R 15 Claims



1. A device for controlling the density of continuously shirred casing and spinning such casing, said device comprising a frame, bearing means mounting said frame for rotation about a fixed axis, at least two drive belts having spaced driving runs opposing said axis for cooperation to drive a shirred casing along said fixed axis, first drive means for driving said drive belts in unison, and second drive means for rotating said frame about said axis.

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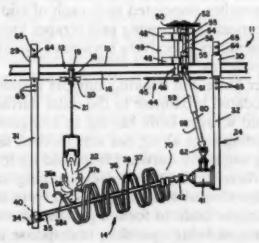
4,336,633

## POULTRY PROCESSING METHOD AND APPARATUS

Horace J. De Long, Rte. 6, Garrison Rd., Box 257A, Macon, Ga. 31201

Filed Aug. 20, 1979, Ser. No. 68,204
Int. Cl.³ A22B *3/06;* A22C *21/00*
U.S. Cl. 17—51 17 Claims



1. In a poultry processing system wherein a plurality of birds are suspended in an inverted attitude and moved in a series along a processing path by a conveyor through a plurality of processing steps, the improvement comprising wiping the neck feathers on opposite sides of the neck of each bird in a direction extending laterally across the length of the neck of each bird in

a direction transverse to the processing path as the birds move along the processing path to move the feathers out of the way of a cutting means, and cutting with a cutting means through the skin and tissue of the neck on opposite sides of the neck at the areas of the neck where the feathers have been wiped with a motion laterally transverse to the processing path.

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4,336,634

## APPARATUS FOR THE SEVERING OF THE FILLETS FROM THE SKELETON OF FISH

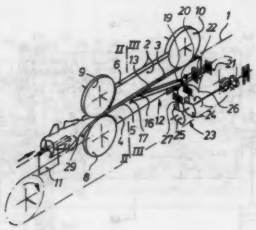
Horst Braeger, Lübeck, Fed. Rep. of Germany, assignor to Nordischer Maschinenbau Rud. GmbH Co. KG, Lübeck, Fed. Rep. of Germany

Filed May 1, 1980, Ser. No. 145,664

Claims priority, application Fed. Rep. of Germany, Nov. 15, 1979, 2946042

Int. Cl.[3] A22C *25/16*

U.S. Cl. 17—57 5 Claims



1. Apparatus for the severing of the fillets from the skeleton of fish, said apparatus comprising

means for conveying a fish with tail forwards along a guide path,

belly filleting means and back filleting means located downstream of said guide path, and fillet severing means located downstream of said guide path,

guide means for guiding said fish from said belly and back filleting means to said fillet severing means, and comprising spaced belly guide members and spaced back guide members aligned with said belly guide members and located thereabove, with the lower edges of said back guide members being spaced above the upper edges of said belly guide members to provide a space therebetween, said guide means being located in the planes of said belly filleting means and back filleting means and extending downstream thereof,

and tool means for cutting free the ribs of said fish, located downstream of said belly and back filleting means and upstream of said severing means,

wherein said tool means comprises respective scraper knives arranged on opposite sides of said guide means, a backing support member associated with each of said scraper knives, and drive means for moving said scraper knives and backing support members selectively between a lowered position and a raised position,

each scraper knife and backing support member having a tip portion located proximate to the outer surface of said guide means, said scraper knife having an elongated body formed with a cutting edge along one side thereof, said cutting edge diverging angularly outward from said tip toward the opposite end thereof, the tip of each backing support member being bulge-shaped and being spaced from the cutting edge of said scraper knife to form a gap therebetween,

said drive means being operable, in response to movement of the abdominal cavity of a fish into proximity to said tool means, to move each scraper knife from its lowered position, in which its tip portion is located below the upper edge of said belly guide member, to its raised position in which its tip portion is located substantially at the level of the lower edge of said back guide member, and also to move each backing support member from its lowered position, in which its tip is located adjacent to an intermediate portion of said belly guide member, to its raised position in which its tip portion is located at the level of the upper edge of said belly guide member.

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4,336,635

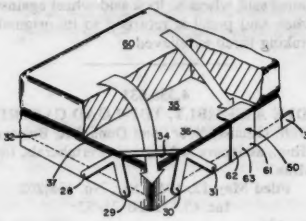
## BED SHEET OR THE LIKE SECURING MEANS

Rose M. Lantz, 170 Sylvia St., Arlington, Mass. 02174

Filed Apr. 13, 1979, Ser. No. 29,747

Int. Cl.[3] A47C *21/02;* A47G *9/04*

U.S. Cl. 24—72.5 8 Claims



1. Means for securing and maintaining a bed sheet or the like on a mattress of a bed supported on a platform like support means having a planar upper surface, said securing means comprising in combination a centrally disposed, elongated body member for association with the planar upper surface of said support means and defined by first and second sides and first and second ends, and bifurcated members comprising first and second branches pivotally connected to each said first and second ends of the body member capable of when pivoted depending perpendicularly downwardly of fastening said body member in close association with said planar upper surface whereby the said bed sheet or the like can be secured between said securing means and the said support means.

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4,336,636

## FASTENING DEVICE

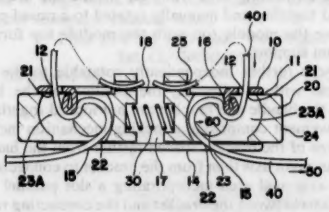
Yoshihiko Ishiguro; Keiko Ishiguro, both of 9-5 Minamikyutaro-cho 4-chome, and Hiromi Shiotani, 9, Ryuzoji-cho, all of Higashi-ku, Osaka-shi, Osaka-fu, Japan

Filed Jan. 30, 1980, Ser. No. 116,830

Claims priority, application Japan, Jan. 30, 1979, 54-9815

Int. Cl.[3] F16G *11/04, 11/00;* A44B *11/10*

U.S. Cl. 24—115 M 13 Claims



1. A fastening device to be used with an object having at least one string which fixes the string in position in relation to an object when the string is affixed by the fastening device, said device comprising:

a casing having a first and second longitudinal sides and having two lateral open ends, said longitudinal sides being oppositely positioned with respect to one another;

said first longitudinal side having a central bore through the center thereof;

said second longitudinal side having two first apertures

therethrough, each of said first apertures being respectively positioned between the axis of said central bore and one of said lateral open ends;

a pair of block members, said block members being oppositely slidably positioned within said casing and respectively having end portions which respectively project from said lateral open ends;

each of said block members having a chamber therein and having a first opening therein which communicates with said chamber, said first opening being substantially aligned with one of said first apertures and communicating therewith;

said block members having two bar members respectively fixedly positioned in said chamber of each of said blocks, each of said bar members extending in a direction substantially transverse to the longitudinal direction of said casing, each of said block members having a shoulder extending outwardly from said central bore for abutting the outer periphery of said central bore for limiting outward movement of the corresponding block member with respect to said casing;

a biasing means positioned within said casing for biasing said block members away from one another; and

said first longitudinal side having two inwardly projecting engaging portions, each of said engaging portions being respectively operatively associated with a corresponding one of said bar members for, when said block members are biased by said biasing means, abutting and affixing a corresponding string, threaded through one of said first apertures and said first opening associated with a corresponding one of said block members and wound at least partially around the associated one of said bar members, against the associated said one of said bar members and thereby preventing the corresponding string from substantial movement in the longitudinal direction thereof with respect to the corresponding block member and thereby fixing the string in position in relation to the object.

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**4,336,637**

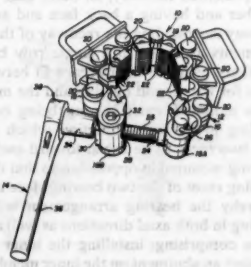
## SAFETY CLAMP

**Robert E. Patterson, 614 Shady Glen, Allen, Tex. 75002**

**Filed May 12, 1980, Ser. No. 148,919**

**Int. Cl.³ A44B *21/00***

**U.S. Cl. 24—249 DP** **5 Claims**



1. A clamp used on a pipe, comprising: a clamp portion for extending around and attaching to the pipe, said clamp portion including a body adapted to be positioned around the pipe having a first and a second end, gripping members for engaging the pipe connected to the body, and a screw member pivotally connected to the first end of the body for extending through a passageway in a member connected to the second end of the body; and a wrench portion for tightening said clamp portion around the pipe, said wrench portion including a nut for moving the threaded member relative thereto, a handle for transferring a torque to said nut, and means for connecting the nut to the handle, said connecting means having ratchet means for transferring the torque to the nut when the handle is turned in a first direction while permitting movement of the handle in an opposed direction without applying torque to the nut, said wrench portion and said ratchet means further comprising a cylindrical passageway coaxial with said nut to enable said screw member to extend through said wrench portion as said clamp is tightened around said pipe.

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**4,336,638**

## APPARATUS FOR STRETCHING PLASTIC WEBS

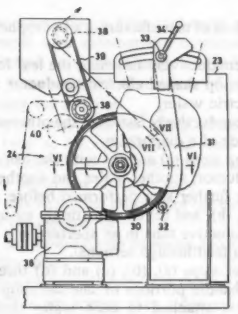
**Frank B. Mercer, Blackburn, England, assignor to Netlon Limited, Blackburn, England**

**Continuation-in-part of Ser. No. 873,945, Jan. 31, 1978, abandoned, which is a division of Ser. No. 689,127, May 24, 1976, Pat. No. 4,087,226. This application Oct. 17, 1978, Ser. No. 952,211**

**Claims priority, application United Kingdom, May 23, 1975, 22649/75; Oct. 17, 1977, 43159/77; Feb. 9, 1978, 5305/78; May 31, 1978, 43159/78**

**Int. Cl.³ D06C *3/06***

**U.S. Cl. 26—99** **14 Claims**



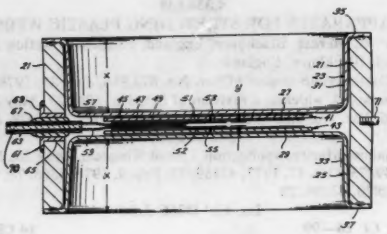
1. Apparatus for transversely stretching and molecularly orientating a continuously advancing flexible web, comprising restraining means for preventing substantial inward movement of the web margins, a pair of opposed banks of transversely-spaced pressure elements between which banks the web can travel while its margins are engaged by the restraining means, the pressure elements of one bank being transversely staggered in relation to the elements of the other bank and, as seen looking in the transverse direction, overlapping the pressure elements of the other bank with such a degree of overlap that the pressure elements cause the web to take up an extended form from margin to margin by applying opposed forces respectively to the opposite surfaces of the web at spaced locations across the width of the web and transversely stretch the web into a pleated form without substantial inward movement of the web margins, the pressure elements of at least one of the banks being stationary pressure members providing slide surfaces extending in the direction of advance of the web wherein the slide surfaces provide a reduced initial rate of stretch of the web which increases at a substantially constant rate of stretch in transit between the opposed pressure elements, said reduced initial rate of stretch being provided by biasing of the stationary pressure members against one side of the web, which web is biased on its other side by the opposed pressure elements, the relationship between the pressure elements being such that the distance between the slide surfaces of the stationary pressure members and the surfaces of the opposed pressure elements increases with the distance along the slide surfaces, the initial contact point of the stationary pressure members with the web being substantially tangential to the peripheries of the opposed pressure elements, and drive means for continuously advancing the web between the banks whereby the pressure elements continuously transversely stretch the web.

4,336,639

## METHOD OF MAKING A SEISMIC APPARATUS

Carl O. Berglund, Houston, Tex., assignor to Teledyne Exploration Company, Houston, Tex.

Filed Mar. 31, 1980, Ser. No. 135,476
Int. Cl.[3] H01L 41/22
U.S. Cl. 29—25.35 6 Claims



1. The method of manufacturing a hydrophone including the steps of

(a) electroconductively fastening the leaf forming the body of a lollypop shaped electric conductor to one side of a piezoelectric wafer,

(b) electroconductively fastening the other side of said wafer to one side of a diaphragm,

(c) repeating steps (a) and (b) with the leaf of another electric conductor, another wafer and another diaphragm,

(d) and the further step performed before, during, or after steps (a), (b), and (c) of insulatingly mounting an electrically conductive tube in an aperture in a conductive ring to form a feedthrough terminal,

(e) and after steps (a), (b), (c) and (d) threading the distal ends of handle portions of said lollypop shaped electric connectors attached to each wafer through said feedthrough terminal,

(f) inserting said diaphragms coaxially in said ring by holding on to flanges extending axially from the rims of the diaphragms,

(g) moving said diaphragms into said ring until lips on the flanges engage the ends of the ring,

(h) welding said flanges to the ends of said ring,

(i) filling with electroconductive solder said tube of said feedthrough terminal to join said tube and said electric conductors therein electroconductively.

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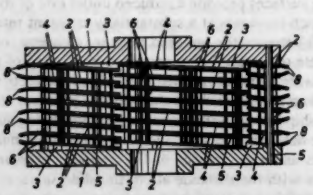
4,336,640

## CYLINDRICAL TURNING TOOL

Karl Willinger, Vienna, Austria, assignor to Miba Sintermetall Aktiengesellschaft, Laskirchen, Austria

Filed Oct. 20, 1980, Ser. No. 198,443
Claims priority, application Austria, Nov. 5, 1979, 7083/79
Int. Cl.[3] B23D 71/00; B21K 21/00
U.S. Cl. 29—79 4 Claims



1. In a cylindrical turning tool for machining pneumatic tires for vehicles, which tool comprises a plurality of peripherally consecutive, segment-shaped cutter blades, which constitute a peripheral surface of the tool and are axially spaced apart and extend in planes that are transverse to the axis of the tool, each of said blades having a radially outer edge and cutting teeth carried by said outer edge,

the improvement residing in that

said radially outer edge of each of said blades comprises at least one tooth-carrying edge portion which is bent out of the plane of said blade,

and

peripherally consecutive ones of said tooth-carrying edge portions of said tool are bent out to opposite sides.

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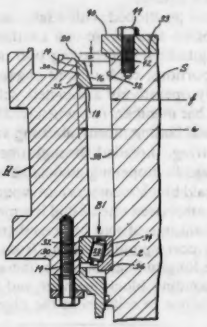
4,336,641

## BEARING SETTING PROCESS

Ravi R. Bhatia, Canton, Ohio, assignor to The Timken Company, Canton, Ohio

Filed Mar. 16, 1979, Ser. No. 21,232
Int. Cl.[3] B21D 53/10
U.S. Cl. 29—148.4 A 6 Claims



1. A process for assembling and setting a bearing arrangement that permits an inner member of a mounting to rotate relative to an outer member of the mounting or vice-versa and includes first and second bearings that are spaced apart along an axis of rotation, with each bearing including an inner race mounted on the inner member and having a back face and an outwardly presented raceway, an outer race mounted on the outer member and having a back face and an inwardly presented raceway surrounding the raceway of the inner race, and rolling elements arranged in a single row between the two raceways, there being an interference fit between at least one of the races for the second bearing and the member on which that race is mounted, each bearing being capable of taking thrust loading in the axial direction which causes the back faces of its two races to be urged toward each other, the two bearings being mounted in opposition so that the back faces for corresponding races of the two bearings face in opposite directions, whereby the bearing arrangement will accommodate thrust loading in both axial directions as well as radial loading; said process comprising: installing the inner race of the first bearing against an abutment on the inner member; installing the outer race of the first bearing against an abutment on the outer member; installing one race of the second bearing against an abutment on the member for that race; thereafter placing the first bearing under a thrust load to properly seat the rolling elements thereof against the raceways for that bearing so that no end play exists in the first bearing; measuring the axial distance between a location on said one race of the second bearing and a radial surface along the member on which the other race of the second bearing is to be mounted; noting from a code associated with the second bearing, deviations from the nominal value of the standout for that bearing and from the nominal value of the diameter of at least one surface on that bearing along which an interference fit exists; consulting a reference source which for various combinations of coded

standout and interference fit deviations provides an axial dimension that reflects the algebraic sum of at least the nominal bearing standout, the deviation in the bearing standout, the lateral removed as a result of the interference fit at said one surface when the diameter of that surface is considered at its nominal value, the further lateral removed as a result of any deviation from the nominal value of the diameter of said one surface; selecting a spacer for installation against the radial surface that is along the member along which said other race of the second bearing is to be mounted, the thickness of the spacer being derived by algebraically combining the measured distance and the axial dimension derived from the reference source; installing said other race of the second bearing along the member for that race and into an operative position with respect to said one race of the second bearing; installing the spacer on the member on which said other race of the second bearing is mounted; and installing an abutment on the member on which said other race of the second bearing is mounted such that the abutment along with the spacer control the axial position of said other race of the second bearing along the member on which said other race is mounted.

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**4,336,642**

## METHOD OF ENLARGING THE HEAT EXCHANGE SURFACE OF A TUBULAR ELEMENT

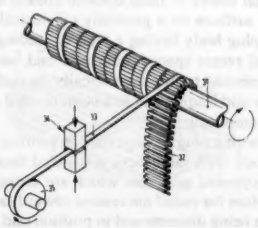
**Gerhardus A. Engelberts, Breda, Netherlands, assignor to B.V. Machinefabriek Breda v/h Backer & Rueb, Breda, Netherlands**

**Division of Ser. No. 830,311, Sep. 2, 1977, Pat. No. 4,163,473, which is a continuation of Ser. No. 640,765, Dec. 15, 1975, abandoned. This application Aug. 2, 1979, Ser. No. 63,342**

**Claims priority, application Netherlands, Dec. 24, 1974, 7416886; Dec. 24, 1974, 7416887**

**Int. Cl.³ B23P** *15/26*

**U.S. Cl. 29—157.3 A** **4 Claims**



1. The method of fabricating a heat exchange element including a corrugated heat transfer strip secured to a tubular element by a clamping strip, said method comprising the steps of providing a tubular element, a length of a corrugated heat transfer strip, and a clamping strip, securing one end of said clamping strip to said tubular element, placing one end of said corrugated strip between said clamping strip and said tubular element, helically winding said clamping strip and said corrugated strip simultaneously on said tubular element while said clamping strip is maintained under tension so that said corrugated strip is continuously clamped to said tubular element, and after said length of corrugated strip is clamped to said tubular element securing said clamping strip to the thus formed heat exchange element.

**4,336,643**

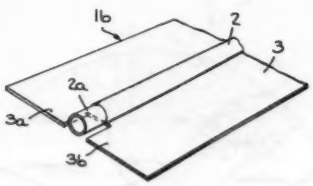
## METHOD FOR THE PROCESSING OF HEAT EXCHANGER, TUBE-STRIP ELEMENTS

**Sidney Roberts, Stamford, Conn., assignor to Thermatool Corp., Stamford, Conn.**

**Filed Feb. 19, 1980, Ser. No. 122,468**

**Int. Cl.³ B23P** *15/26*

**U.S. Cl. 29—157.3 C** **5 Claims**




1. Method for processing a heat exchanger panel element comprising a metal tube substantially continuously secured throughout its length to a metal strip, said strip being wide relative to the cross-sectional dimension of said tube, said method comprising the steps of:

when the tube is not rectilinear along its axis, gripping at least said tube at its opposite ends and mechanically stretching it length-wise to at least cause said tube to be substantially rectilinear along its axis;

mechanically modifying the portions of the element at opposite ends of the element to:

(a) remove any non-circular cross-section of the end portions of the tube;

(b) provide an exterior diameter for the end portions of the tube which is not greater than a desired diameter; and

(c) remove portions of the strip outwardly of and adjacent to said end portions of said tube while leaving other portions of the strip outwardly of the portions thereof which are removed; and

modifying the remaining portions of said strip outwardly of said tube portions at said opposite ends, so that said tube portions extend beyond the ends of the strip, the steps being performed in any order.

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**4,336,644**

## METHOD OF INSTALLING BULLETPROOF WINDOWS IN AN ARMORED AUTOMOBILE

**Richard C. Medlin, 6940 NW. 14th Ave., Ft. Lauderdale, Fla. 33309**

**Continuation-in-part of Ser. No. 920,715, Jun. 30, 1978. This application Dec. 24, 1980, Ser. No. 219,882**

**Int. Cl.³ F41H** *7/04;* **B60J** *1/00*

**U.S. Cl. 29—401.1** **9 Claims**

1. A method of installing bulletproof front and/or rear windows of an aromored automobile consisting of the following steps:

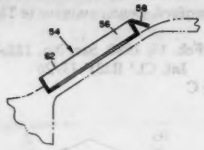
removing original windows and molding;

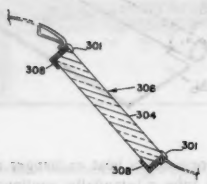
altering the window frame area to accommodate a thicker depth of said bulletproof window by the following;

removing a first lip of a mechanism that retains said original windows in position; and

replacing said first lip with a second lip that will provide said thicker depth to retain said bulletproof window in position;

installing said bulletproof window in said altered window frame area; and






restoring said window frame with said bulletproof window in position so said armored automobile appears as an ordinary automobile.

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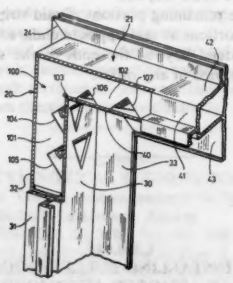
**4,336,645**

## FRAME CORNER STRUCTURE

**Carlo G. Bucci, Bronte, Canada, assignor to Repla Limited, Oakville, Canada**

**Division of Ser. No. 831,521, Sep. 8, 1977, Pat. No. 4,192,624. This application Nov. 8, 1979, Ser. No. 92,526**
**Claims priority, application Canada, Jul. 20, 1977, 283119**
**Int. Cl.³ B21D *39/00*; B23P *11/00***
**U.S. Cl. 29—510** **5 Claims**



5. A method of manufacturing a corner structure for window frames and the like comprising:

providing a pair of metal frame members each having a longitudinally extending channel extending from a mitred end, each channel being defined by opposed sides,

providing a bracket having a pair of angularly disposed legs slidably receivable in the channels of said frame members, each leg having a surface opposed to a surface on an adjacent leg, and each opposed surface having a pair of longitudinally spaced depressions therein, the depression in each leg nearest the other leg having a depth less than the depth of the other depression in the leg by at least the thickness of a side of the channel of a frame member,

inserting the bracket legs into the channels of the frame members to cause the mitred ends of the frame members to abut,

forcing a die, having four striking elements, such that the striking elements are of a dimension that permits two of the striking elements to make contact and traverse the walls of the opposed sides of the corner structure, before the other two striking elements make contact with said opposed sides, against the frame member channels to strike out tongues from each frame member channel into the deeper depressions in the bracket arms and immediately thereafter to strike out tongues from each frame member into the depressions of less depth in the bracket arms to urge the mitred ends of the frame members together, each tongue extending in a direction away from the respective mitred end.

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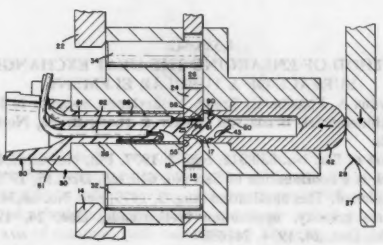
**4,336,646**

## APPARATUS FOR SHEARING AND CRIMPING

**Steven Feldman, Seminole, Fla., assignor to AMP Incorporated, Harrisburg, Pa.**

**Filed Oct. 16, 1980, Ser. No. 197,403**
**Int. Cl.³ H01R *43/04***
**U.S. Cl. 29—564.2** **2 Claims**



1. An apparatus for shearing and crimping a preformed tubular metal sleeve to form discrete coaxial first and second conductive surfaces on a generally cylindrical dielectric plug body, said plug body having a tapered leading end and a circumferential recess spaced from said end, said metal sleeve being dimensioned to fit concentrically on said plug body and extend from said leading end to a point beyond said recess, said apparatus comprising:

a holder with a plug passage therein profiled to receive said plug body with said sleeve assembled thereto,

a pair of opposed neck dies which are slideably mounted in said holder for radial movement toward said passage, said passage being dimensioned to position said plug body with said recess positioned centrally of said neck dies when said plug body with said sleeve assembled thereto is fully received in said passage,

a nose die slideably mounted in said holder for axial movement toward said passage,

actuating means for initially driving said neck dies radially inward toward said passage and thereafter to drive said nose die axially toward said passage, whereby,

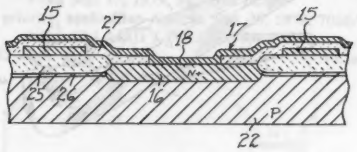
said plug body with said sleeve assembled thereto may be placed in said passage with said recess positioned centrally of said neck dies, said neck dies may be driven toward said plug body to shear said sleeve and crimp it into said recess forming said discrete first and second conductive surfaces, and said nose die may be moved axially toward said tapered leading end to form said sleeve thereto.

4,336,647

## METHOD OF MAKING IMPLANT PROGRAMMABLE N-CHANNEL READ ONLY MEMORY

David J. McElroy, Houston, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 21, 1979, Ser. No. 106,126
Int. Cl.³ H01L 21/425; G11C 11/40
U.S. Cl. 29—571 11 Claims




1. A method of making a read-only-memory comprising the steps of:

forming a plurality of insulated gate field effect transistors in a face of a semiconductor body, each of the transistors having a source, a drain and a polysilicon gate, the transistors being in a regular pattern of rows and columns to provide an array of memory cells, metal column lines extending along said face and making electrical contact to all of the sources and drains;

masking said face to expose areas above selected ones of said gates and cover the gates of other of the transistors, and thereafter ion-implanting to program the array of memory cells by the masked ion implant in areas between the metal lines and penetrating through the gates of said selected ones of the field effect transistors.

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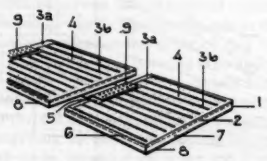
4,336,648

## METHOD OF CONTACTING A SOLAR CELL

Willi Pschunder, Ilsfeld, and Gerhard Steinmetz, Bretzfeld-Dimbach, both of Fed. Rep. of Germany, assignors to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Fed. Rep. of Germany

Filed Oct. 31, 1980, Ser. No. 202,731
Claims priority, application Fed. Rep. of Germany, Nov. 2, 1979, 2944185
Int. Cl.³ H01L 31/18
U.S. Cl. 29—572 11 Claims



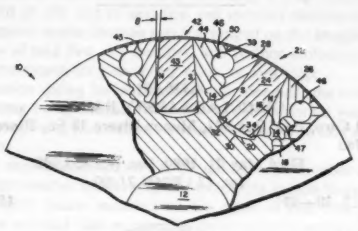

1. In a method for fabricating a solar cell composed of a semiconductor body containing a pn-junction and presenting opposed surfaces, one of which surfaces is a front surface provided with a metallized area including a front connection region and arranged to be exposed to incident light, and the other of which surfaces is a rear surface presenting a rear connection region, which method includes providing a reflection reducing layer on the front surface to completely cover the metallized area including the entirety of the front connection region, the improvement comprising fixing a metal connector to the front connection region by placing the connector against the reflection reducing layer and conductively connecting the connector to the first connection region while concurrently eliminating the reflection reducing layer from that region.

4,336,649

## METHOD OF MAKING ROTOR ASSEMBLY HAVING ANCHOR WITH UNDULATING SIDES

Jerry Glaser, Playa del Rey, Calif., assignor to The Garrett Corporation, Los Angeles, Calif.

Division of Ser. No. 973,345, Dec. 26, 1978. This application Apr. 7, 1980, Ser. No. 138,019
Int. Cl.³ H02K 15/02
U.S. Cl. 29—598 4 Claims



1. A method of forming a rotor for a permanent magnet machine, comprising the steps of:

forming a non-magnetic rotor hub having a plurality of equally spaced, radially extending tongues with undulating sides;

forming a plurality of assemblies of a wedge-shaped tangentially magnetized permanent magnet having outwardly converging sides between a pair of wedge-shaped ferromagnetic support members, each of said support members having a smooth side secured to the permanent magnet and an opposite side having a radially outer smooth portion and a radially inner undulating portion; and

inserting a formed assembly between the radially extending tongues of the rotor hub with radially outer smooth portions of adjacent assemblies in contact and the radially inner undulating portions cooperating with the corresponding undulating sides of the radially extending tongues.

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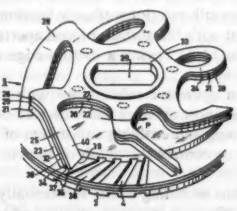
4,336,650

## CUTTING UNIT FOR A SHAVING APPARATUS

Willem K. Gorter, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 17, 1980, Ser. No. 207,322
Claims priority, application Netherlands, Dec. 17, 1979, 7909059
Int. Cl.³ B26B 19/42
U.S. Cl. 30—34.2 7 Claims



1. A shaving apparatus having a circular shear plate provided with hair-entrance apertures and a cutting unit associated with and rotatable relative to the shear plate; said cutting unit comprising a cutting member having a circular central body, cutters extending from the circumference of said central body toward the shear plate, a lead-cutting element having a

circular central portion, lead cutters extending from the circumference of said central portion toward the shear plate and respectively associated with and movable relative to the cutters away from and toward the shear plate, each lead cutter, with reference to the direction of rotation of the cutting unit, being positioned in front of its associated cutter, and a spacer interposed between each cutter and its associated lead cutter.

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**4,336,651**

## CIRCULAR SAFETY RAZOR

**Israel Caro, P.O. Box 841, Munoz Rivera 18 St., Rincon, P.R. 00743**

**Filed May 21, 1980, Ser. No. 151,940**
**Int. Cl.³ B26B *21/00***
**U.S. Cl. 30—49** **15 Claims**

1. A razor assembly comprising:

a disc-shaped support member defining first and second opposed and substantially planar surfaces and a circumferential surface extending between said first and second surfaces, and an axially positioned aperture extending through said member between said opposed surfaces;

a first annular boss defining inner and outer surfaces and projecting from said first planar surface in cooperating relationship with said first planar surface to define a first interior space;

a substantially cylindrically shaped control member defining a centrally located smooth exterior surface and a threaded end, said control member positioned within said aperture with said smooth exterior surface in frictional but movable engagement with the surface of said aperture;

a first annular blade having a cutting edge along its inner margin;

first means in operative relationship with said blade, said boss, said support member and with said control member for positioning and enabling adjustment of the position of said blade to control the depth of the cut of the hair or beard;

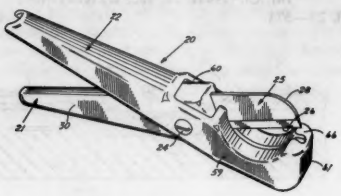
said first means including a first substantially planar spacer member defining a centrally positioned aperture and a plurality of substantially coplanar lugs, said spacer member positioned on said first planar surface within said first interior space with said lugs adjacent to said inner surface of said annular boss and with said control member projecting through said spacer member aperture, and a first plurality of projecting members extending from one side of said spacer member.

**4,336,652**

## CUTTING TOOL FOR FLEXIBLE PLASTIC CONDUIT

**Duane D. Robertson, 105 Flora Way, Golden, Colo. 80401**

**Filed Aug. 1, 1980, Ser. No. 174,727**
**Int. Cl.³ B26B *13/00***
**U.S. Cl. 30—258** **7 Claims**



1. A cutting tool for cutting flexible plastic conduit comprising a pair of handled jaws pivotally connected intermediate their ends, one of said jaws having a handle at one end and a knife blade extending from the other end thereof opposite to said handle, said knife blade having a longitudinal cutting edge, the other of said jaws defining a channel-shaped handle at one end and a semi-circular concave anvil at the other end, said anvil having an axially extending slot therein for receiving the cutting edge of said knife blade when said handles are closed together with the said one handle nested within said channel-shaped handle, whereby a conduit supported in said semi-circular anvil can be cut readily by said knife blade upon squeezing said handles together while swinging said tool relative to said conduit and said conduit being completely severed as said knife blade edge is received in said slot.

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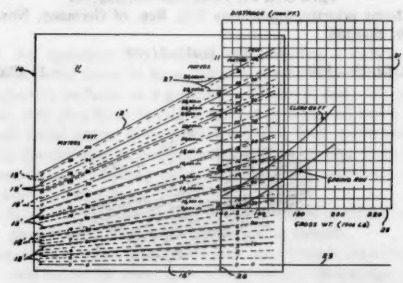
**4,336,653**

## ENGLISH UNIT TO METRIC UNIT CONVERSION DEVICE

**Robert P. Stanton, 1436 Millrace, Fairborn, Ohio 45324**

**Filed Sep. 27, 1976, Ser. No. 727,324**
**Int. Cl.³ G01B *3/02***
**U.S. Cl. 33—1 B** **1 Claim**



1. The method of determining dimensions in one system of measurements on a drawing having at least one known dimension in a second system of measurements, comprising: placing a transparent sheet having; a base line and a first series of diverging straight lines each spaced distances proportional to an integral number of units along any perpendicular in said one system of measurement from the base line and a second series of divergent straight lines, on the same side of the base line as the first series of straight lines, each spaced from the base line distances proportional to an integral number of units along any perpendicular in the second system of measurement; over the drawing; moving the transparent sheet over the drawing until the known dimension on the drawing coincides with the corresponding dimension along a certain perpendicular to the base line in the second system of measurement; drawing a line on

said transparent sheet along said certain perpendicular; moving the line along said certain perpendicular to other portions of the drawing to determine the dimensions.

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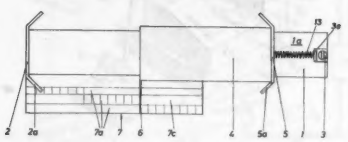
4,336,654

## ADJUSTING DEVICE FOR SKI BINDINGS

**Josef Svoboda, and Rupert Hofbauer, both of Schwechat, Austria, assignors to TMC Corporation, Baar, Switzerland**

**Filed Sep. 12, 1979, Ser. No. 74,624**
**Claims priority, application Austria, Sep. 29, 1978, 7068/78**
**Int. Cl.³ A43D 1/00; A63C 9/08**
**U.S. Cl. 33—3 A** **4 Claims**



1. An adjusting device for facilitating a correct adjustment of a thrust force applied by a thrust spring onto a heel holder for urging said heel holder toward a toe jaw, said thrust spring yielding in response to the placement of a ski boot between said heel holder and said toe jaw, comprising in combination:

an elongated first rail member;

an elongated slide member movably mounted on said first rail member;

support means mounted on each of said first rail member and said slide member and adjacent ends thereof that are remote from each other for releasably engaging respectively one of a toe portion and a heel portion on said ski boot, said support means including a support surface on said first rail member and on said slide member and at least one guide plate associated with each said support surface, each said guide plate being bent approximately 45° with respect to said associated support surface, the height of each of said support surfaces and of said guide plates corresponding at least with the thickness of a sole of said ski boot which is to be measured, wherein between an upper surface of said first rail member and the underside of said guide plate associated with said support surface on said first rail member there is provided a free space which permits a movement of said slide member to a position abutting said support surface on said first rail member;

first scale means mounted on one of said first rail member and said slide member and having first indicating indicia thereon, first pointer means mounted on the other of said first rail member and said slide member for pointing at an appropriate one of said first indicia in response to a certain length ski boot being present between, and with said toe portion and said heel portion thereof engaging, said support means and;

a heel binding comprising an elongated second rail member which is adapted to be mounted on a ski and a carriage having said heel holder mounted thereon movably mounted on said second rail member, a second scale means mounted on one of said second rail member and said carriage and having second indicating indicia thereon, and a second pointer means mounted on the other of said second rail member and said carriage for pointing at a selected one of said second indicia in response to a relative movement between said second rail member and said carriage and corresponding to the indicia indicated on said first scale means by said first pointer, whereby the position of said carriage and, consequently the position of said heel holder, will be appropriately oriented relative to said toe jaw on said ski.

3. An adjusting device for facilitating a correct adjustment of a thrust force applied by a thrust spring onto a heel holder for urging said heel holder toward a toe jaw, said thrust spring yielding in response to the placement of a ski boot between said heel holder and said toe jaw, comprising in combination:

an elongated first rail member;

an elongated slide member movably mounted on said first rail member;

support means mounted on each of said first rail member and said slide member and adjacent ends thereof that are remote from each other for releasably engaging respectively one of a toe portion and a heel portion on said ski boot;

stop means for determining the largest inside dimension between said support means on said first rail member and said slide member, said stop means including a stop which is provided on the end of said first rail member remote from said support means thereon and is arranged on the longitudinal axis of said first rail member, and further including securement means for preventing a loss of said stop;

a compression spring for biasing said slide member, one end of said spring being fastened to said stop and the other end of said spring being fastened to said support means on said slide member;

first scale means mounted on one of said first rail member and said slide member and having first indicating indicia thereon, first pointer means mounted on the other of said first rail member and said slide member for pointing at an appropriate one of said first indicia in response to a certain length ski booth being present between, and with said toe portion and said heel portion thereof engaging, said support means; and

a heel binding comprising an elongated second rail member which is adapted to be mounted on a ski and a carriage having said heel holder mounted thereon movably mounted on said second rail member, a second scale means mounted on one of said second rail member and said carriage and having second indicating indicia thereon, and a second pointer means mounted on the other of said second rail member and said carriage for pointing at a selected one of said second indicia in response to a relative movement between said second rail member and said carriage and corresponding to the indicia indicated on said first scale means by said first pointer, whereby the position of said carriage and, consequently the position of said heel holder, will be appropriately oriented relative to said toe jaw on said ski.

4. An adjusting device for facilitating a correct adjustment of a thrust force applied by a thrust spring onto a heel holder for urging said heel holder toward a toe jaw, said thrust spring yielding in response to the placement of a ski boot between said heel holder and said toe jaw, comprising in combination:

an elongated first rail member;

an elongated slide member movably mounted on said first rail member;

support means mounted on each of said first rail member and said slide member and adjacent ends thereof that are remote from each other for releasably engaging respectively one of a toe portion and a heel portion on said ski boot;

first scale means mounted on one of said first rail member and said slide member and having first indicating indicia thereon, first pointer means mounted on the other of said first rail member and said slide member for pointing at an appropriate one of said first indicia in response to a certain length ski boot being present between, and with said toe portion and said heel portion thereof engaging, said support means, said first indicia including plural rows of markings, of which one row is designated for a children's ski binding and the other two rows are designated for adult ski bindings; and

a heel binding comprising an elongated second rail member which is adapted to be mounted on a ski and a carriage having said heel holder mounted thereon movably mounted on said second rail member, a second scale means mounted on one of said second rail member and said carriage and having second indicating indicia thereon, and a second pointer means mounted on the other of said second rail member and said carriage for pointing at a selected one of said second indicia in response to a relative movement between said second rail member and said carriage and corresponding to the indicia indicated on said first scale means by said first pointer, whereby the position of said carriage and,

consequently the position of said heel holder, will be appropriately oriented relative to said toe jaw on said ski.

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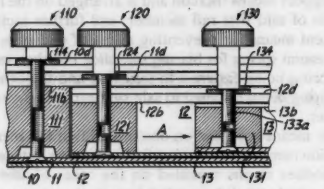
4,336,655

## RULE OR MEASURING ROD

Hans K. Thingstad, Fornbacken 5, 151 58 Södertälje, Sweden

Filed Aug. 1, 1980, Ser. No. 174,629
Claims priority, application Sweden, Aug. 1, 1979, 7906655
Int. Cl.³ G01B 3/08
U.S. Cl. 33—161 4 Claims




1. A rule or measuring rod comprising a plurality of telescopic components arranged to slide in relation to each other, two components may be clamped together by a locking device, each component being in the form of a rail of substantially U-shaped cross section, the extremities of the legs of each of the sections are in the form of projections which face each other, one end of the outermost component provides a rigid support for a clamping device for one rod, a second clamping device for a second rod being arranged to slide inside the innermost component, an end of the innermost component remote from the one end of the outermost component includes a stop to restrict the travel of the second clamping device, whereby with the first clamping device attached to the one end of the outermost component and with the second clamping device attached to the end of the innermost component, the relative position of the rods may be increased by extending the components relative to each other, each of the clamping devices for the rods is provided with two holes set at right angles to each other and capable of completely surrounding the respective rod, each of the rods forms a right angle to the direction of travel of the components when positioned in a first hole, each of the rods being parallel to the direction of travel when positioned in a second hole in a respective clamping device, and a single clamping screw is provided to secure the respective rod either in one or the other of the two holes in each clamping device.

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4,336,656

## METHOD AND APPARATUS FOR POSITIONING A TAPERED MEMBER TO VERIFY THE ACCURACY OF THE TAPER

H. Glenn Lewis, Westland, Mich., assignor to Sandvik AB, Sandviken, Sweden

Filed Jun. 9, 1980, Ser. No. 157,844
Int. Cl.³ G01B 3/56, 5/24
U.S. Cl. 33—174 E 18 Claims

1. Apparatus adapted for use with a gauge to position a tapered member so that the taper of a tapered surface thereof may be detected and verified by the gauge, said apparatus comprising:

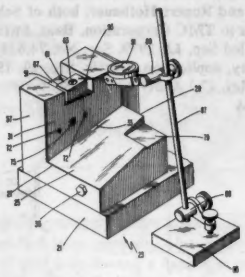
first surface means;

second surface means extending at an angle relative to a first longitudinal axis of said first surface means, said angle comprising one half the included angle of the desired taper;

with the tapered surface positioned against said first and second surface means and with the taper corresponding to the desired taper:

said first axis is coplanar with a centerline of said member, and

a portion of said tapered surface remote from said first surface means is disposed at a preselected level suitable for gauge detection; and



a surface fixed relative to said first and second surface means and disposed at said preselected level for being contacted by a gauge to enable the gauge to be preset.

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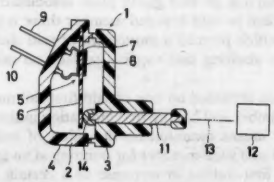
4,336,657

## POSITION SENSOR

Shinichiro Iwasaki, Auburn Heights, Mich., assignor to Aisin Seiki Company, Limited, Kariya, Japan

Filed Aug. 29, 1980, Ser. No. 182,696
Int. Cl.³ G01B 7/24
U.S. Cl. 33—174 L 5 Claims




1. A position sensor for detecting displacement of an operative device, comprising:

a movable member coupled to said operative device;

core means including a magnetically soft amorphous metal member in which is produced a stress in response to the displacement of said movable member and an elastic member operatively connected to said movable member, said magnetically soft amorphous metal member being cemented integrally on a surface of said elastic member;

electrical coil means including at least one coil wound on said core means for sensing a change in permeability of said magnetically soft amorphous metal member as produced by said displacement responsive stress;

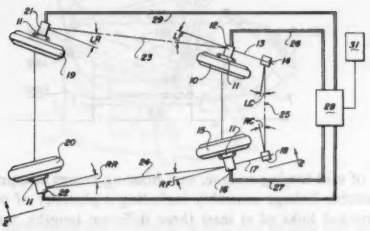
means for applying an electrical signal to said coil to saturate magnetically said core means; and

means for producing a displacement output signal indicative of the displacement of said operative device based on the amount of time between application of said electrical signal and saturation of said core means.

## 4,336,658
## METHOD OF EFFECTING COMPENSATION OF COOPERATIVELY COUPLED VEHICLE WHEEL ALIGNER INSTRUMENTS

Daniel B. January, Bel-Ridge; Dean O. Grubbs, Manchester, and James M. Grossman, Chesterfield, all of Mo., assignors to Hunter Engineering Company, Bridgeton, Mo.

Filed Jul. 28, 1980, Ser. No. 172,815
Int. Cl.³ G01B 11/275
U.S. Cl. 33—288 8 Claims



1. A method of effecting compensation of the signals from cooperatively coupled transducer instruments in vehicle wheel alignment apparatus for aberrations in said apparatus and in said vehicle wheels, said method comprising:

(a) Mounting a pair of transducer instruments, one to each of a pair of vehicle wheels, such that the transducer instruments are in cooperatively coupled relationship and generate signals responsive to the angular position of said vehicle wheels;

(b) Rotating said vehicle wheels, one at a time, into selected positions substantially 180° apart;

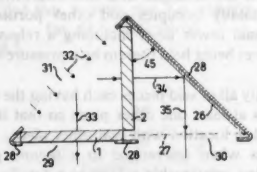
(c) Storing said signals generated by both transducer instruments at each selected position of each said vehicle; and

(d) Compensating the signal from one of the cooperatively coupled pair of transducer instruments with the stored signals generated in response to aberrations in the other transducer instrument of the cooperatively coupled pair on the vehicle wheels and from the reaction of the vehicle wheels upon being rotated into the selected positions.

## 4,336,659
## ANGLE INDICATOR FOR INDICATING TWO MUTUALLY PERPENDICULAR DIRECTIONS

Lars A. Bergkvist, Gottne, 890 42 Mellansel, Sweden

Continuation of Ser. No. 40,393, May 18, 1979, abandoned. This application Dec. 30, 1980, Ser. No. 221,374
Claims priority, application Sweden, May 25, 1978, 7806036
Int. Cl.³ G01C 9/16
U.S. Cl. 33—395 5 Claims

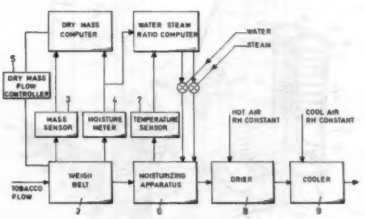


1. Angle indicator for indicating an arbitrary angle to a plumb line in two mutually perpendicular directions comprising two angle indicating devices which each comprise a couple of screens where each screen consists of opaque lines separated by transparent gaps and where screens are placed parallel to one another, whereby interference patterns, so-called moire patterns, are formed when light is transmitted through each of the screen units and where the first screen is rotatably adjustable and the other freely rotable to a pre-determined position relative to the plumb-line, characterized by the fact that each one of the pairs of screens are placed in mutually perpendicular planes and by the fact that a mirror is mounted in a plane which intersects the planes of the two pairs of screens at parallel lines of intersection to project a mirror image of the second of said pair of screens in one plane in which a first pair of said pair of screens is located and to the side of said first pair, whereby in viewing the angle indicator the two moire patterns formed through the two angle indicating devices appear to be lying beside each other; a common housing mounts said mirror and both devices with means enabling rotatable adjustment of said first screens of each device.

## 4,336,660
## DRYING OF TOBACCO PRODUCTS

Mauritz L. Strydom, Cape Province, South Africa, assignor to Tobacco Research and Development Institute Ltd., Zug, Switzerland

Filed Oct. 24, 1980, Ser. No. 200,426
Claims priority, application South Africa, Oct. 25, 1979, 79/5710
Int. Cl.³ F26B 21/06
U.S. Cl. 34—28 4 Claims




1. A method of drying and cooling a tobacco product to a constant moisture content in which the product is premoistened to a constant moisture content prior to being fed to the drying stage, with the improvement that:

(a) the rate of dry mass flow of the product is controlled to be constant;

(b) the temperature of the product, prior to being fed to the drying stage, is controlled to be constant; and

(c) drying and cooling are effected by contacting the product with air at constant relative humidities and constant temperatures and by contact with heated surfaces at constant heat exchange levels.

## 4,336,661
## SHOE INSERT

Walter A. Medrano, 13420 SW. 51 St., Miami, Fla. 33175

Filed Apr. 21, 1980, Ser. No. 142,260
Int. Cl.³ A43B 13/38, 13/40, 7/08
U.S. Cl. 36—44 2 Claims

1. A shoe insert comprising:

an envelope of air impervious material, said envelope, as seen in plan, tracing the outline of a human foot;

said envelope having an upper surface and a lower surface and a side surface joining said upper and lower surfaces, said outline having a heel zone, a forward zone and an intermediate zone,

a flat pad of cushioning foam material in the envelope nestled betweeen the upper and lower and side surfaces;

said side surface comprising a portion extending downwardly and outwardly from said top surface toward but not to said bottom surface and said side surface further comprises a portion extending upwardly from said bottom surface toward but not to said upper surface, and said downwardly extending portion having an inside surface and said portion extending upwardly having an outside surface and said upwardly and downwardly extending portions being heat-sealed at the inside surface of the downwardly extending portion and the outside surface of the upwardly extending portion to enshroud the upwardly extending portion a hole being provided through the upper surface in said intermediate zone spaced from said side surface.

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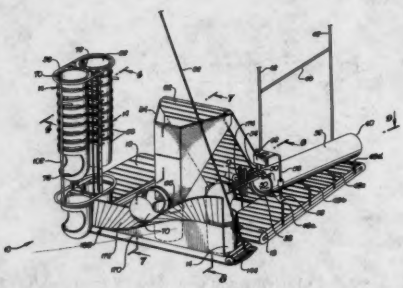
**4,336,662**

## APPARATUS FOR COLLECTING AND RAISING MATERIALS FROM THE OCEAN FLOOR

**Dennis L. Baird, 4315 W. 182nd St., No. 334, Torrance, Calif. 90504**

**Filed Jul. 21, 1980, Ser. No. 170,633**
**Int. Cl.³ E02F *3/00***
**U.S. Cl. 37—54** **48 Claims**



1. A deep sea mining apparatus comprising:

an underwater collection device for gathering material from the ocean floor;

at least one substantially spherical buoyant body;

at least one container, said container including a repository for holding said material and a convex lid for receiving said buoyant body;

means for delivering said container to the ocean floor and dispensing said container;

loading means for depositing said material into said container;

a receptable for delivering said buoyant body to the ocean floor, said receptacle having sufficient density to cause said receptacle holding said buoyant body to sink to the ocean floor;

transfer means for transferring said buoyant body to said container, for ascent of said container and its contents to the ocean surface under the buoyancy of said buoyant body;

means for controlling the ascent of said containers; and

means for discarding said delivering and dispensing means; and for discarding said receptacle.

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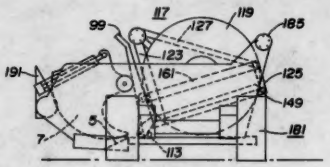
**4,336,663**

## EARTH SCRAPER ASSEMBLY

**Frank Moberly, P.O. Box 3212, Napa, Calif. 94558**

**Filed May 19, 1980, Ser. No. 151,014**
**Int. Cl.³ E02F *3/62***
**U.S. Cl. 37—129** **14 Claims**

1. Earth scraping equipment adapted for towing behind a vehicle, said earth scraping equipment comprising a scraper including a bed rotatable about an axis located behind said bed and including a forward projected blade at the forward end of said bed for slicing into the earth to be scraped, ground engaging support means behind said bed for rear rotatable support of said scraper, a front attachment assembly including a towing tongue having a towing end for connecting said scraper at said towing end to towing apparatus on such towing vehicle, and hoisting means for controlling the elevation of said blade and said scraper bed without altering the elevation of the towing




end of said towing tongue, said hoisting means comprising an adjustable linkage assembly including a plurality of pivotally connected links of at least three different lengths, means for pivoting said links with respect to each other to change the angle between adjacent links, whereby said unequal lengths of said links increase the range of said hoisting limits without altering the elevation of said towing end of said towing tongue.

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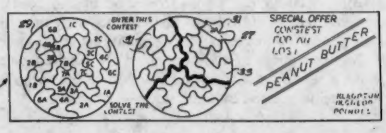
**4,336,664**

## PROMOTIONAL PUZZLE

**Ib Penick, Prospect Heights, and John K. Volkert, Northfield, both of Ill., assignors to Compak System, Inc., Northfield, Ill.**

**Filed Jul. 14, 1977, Ser. No. 815,657**
**Int. Cl.³ G09F *7/12, 19/00;* A63F *9/10***
**U.S. Cl. 40—594** **3 Claims**




1. An advertising or promotional item comprising a frame, which frame carries an announcement in one portion thereof, and

a plurality of separate interfitting pieces of irregular shape formed within another portion bounded by said frame and formed of a lamination of upper and lower sheet material layers, which pieces are formed as a part of said upper layer and are arranged in a first interfitting relationship which totally occupies said other portion within said frame, said lower layer including a release coating and said pieces being held thereto by a pressure-sensitive adhesive.

substantially all of said pieces each having the same irregular shape as at least one other piece so that it can be interchanged in location with said other piece,

said pieces when rearranged to a second predetermined interfitting relationship which also totally occupies said other portion within said frame presenting an intended advertising or promotional message,

said pieces being printed and formed in said first relationship wherein the message is scrambled so that recipients of the item must rearrange the scrambled pieces to discover the hidden message which relates directly to said announcement, and

still another portion of said frame being provided with indicia including an outline of the shape of said pieces and

with a release coating to which said pieces can be releasably adhered.

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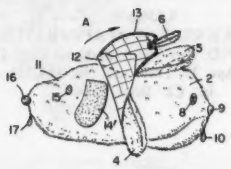
4,336,665
## CONVERTIBLE STUFFED TOY
Claude R. M. Moreau, Elmhurst, N.Y., assignor to AMTOY, Inc., New York, N.Y.
Filed Aug. 20, 1980, Ser. No. 179,759
Int. Cl.³ A63H 3/12
U.S. Cl. 46—153 6 Claims




1. A convertible toy, comprising first and second soft generally round, head members, each head member having a face portion at one end and a neck portion opposite thereto, said head members being disposed with their neck portions connected together with a common juncture and with their face portions disposed toward opposite directions, and a reversible fabric cover in the form of a shell cover connected to said head members along said common juncture for flipping movement about said common juncture, said cover being selectively movable between a first position in which said first head member is covered by said cover and the face portion thereof is concealed by said cover while said second head member is visible and a second position in which said second head member is covered by said cover and the face portion thereof is concealed by said cover while said first head member is visible, said cover being movable between said positions by lifting said cover off one of the head members, turning it inside out and flipping it over the other head member, the head member concealed by said cover serving as a body associated with the visible head member, a plurality of appendage members connected to said shell cover, said plurality of appendage members being movable with said shell cover and in either of said first or second positions of said shell cover forming all of the appendages visibly associated with the head member which is visible, and said appendage members being designed so that when said shell is moved from one of said positions to the other all of the appendage members are reversed and visibly associated with the head which is visible.

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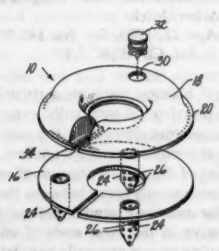
4,336,666
## PLANT WATERERS
Adolph Caso, 158 Hickory Rd., Weston, Mass. 02193
Filed Feb. 7, 1980, Ser. No. 119,300
Int. Cl.³ A01G 29/00
U.S. Cl. 47—48.5 1 Claim




1. A plant waterer, comprising a flexible and hollow reservoir adapted to lie upon the soil in which a plant is potted and including upper and lower C-shaped flexible co-extensive plastic sheets each having a single continuous edge sealed along its entire length to the edge of the other sheet, the bottom sheet being essentially flat and the upper sheet being dome shaped in a vertical plane and formed with an inlet opening for fluids, the waterer further comprising a plurality of metering nozzles formed in imperforate condition, integral with the bottom sheet and adapted to be perforated at the time of being placed in service to adapt the quantity of fluid furnished to the plant extending upwardly through the central portion of the reservoir.

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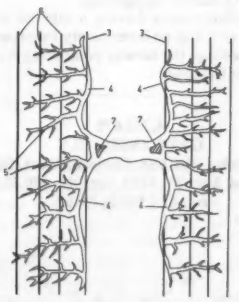
4,336,667
## FRUIT CULTIVATION
Eric R. Evans, R.D. 3, Napier, New Zealand
Filed Aug. 26, 1980, Ser. No. 181,351
Claims priority, application New Zealand, Sep. 6, 1979, 191490
Int. Cl.³ A01G 17/06
U.S. Cl. 47—58 9 Claims




1. A method of training the growth of a twin leader fruit bearing tree in a row of such fruit bearing trees which comprises engaging or holding at at least one level two laterals from one of the two leaders to a main row wise extending member selected from the group consisting wire, tapes, chain, cord, braiding, rope and string so that the distal ends of those laterals are directed oppositely and substantially in a row wise direction and simultaneously and/or subsequently training through, around, over and/or under progressively more outwardly disposed row wise extending members substantially of the same level fruiting branches from said laterals so as to leave the same enmeshed in such row wise extending members to thereby define a layer of fruiting branches.

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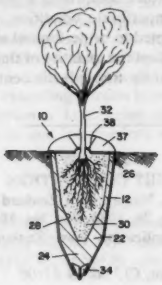
4,336,668
## METHOD FOR PRODUCING GROUND COVER SODS
Henry F. Decker, 4751 Stover Rd., Ostrander, Ohio 43061
Filed Jan. 29, 1981, Ser. No. 229,545
Int. Cl.³ A01G 17/00
U.S. Cl. 47—58 4 Claims

1. A method for producing ground cover sods, comprising establishing parallel spaced row/hill nurseries of ground cover plants which spread laterally by stolons, rhizomes, runners, or tillers, placing plastic sheeting or film on the ground in the spaces between said nurseries, covering said sheeting or film with a growing medium enabling rooting therein by the lateral growth from said nurseries, which growth becomes matted to form a sod, harvesting said sod by cutting off said growth in lines along both edges of the plastic film or sheeting, and removing said sod from between said nurseries.

4,336,669
PLANTING CONTAINER
George N. Gordon, 203 Missouri St., San Francisco, Calif. 94107
Filed Dec. 23, 1980, Ser. No. 219,844
Int. Cl.³ A01G 9/02
U.S. Cl. 47—74 54 Claims




1. A planting container comprising:
at least one tubular cone having a tapered lower end, an open upper end, and an inner cavity for receiving soil and a seed or seedling, the tubular cone being formed by fluid hardened by freezing.

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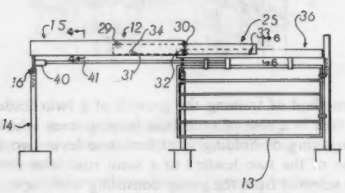
4,336,670
GATE ASSEMBLY
Andrew J. Brutosky, Box 883, Choteau, Mont. 59422
Filed Aug. 25, 1980, Ser. No. 180,572
Int. Cl.³ E05D 13/02
U.S. Cl. 49—409 10 Claims




1. A gate assembly including an upstanding frame member, an elongated main support member affixed to said frame member, said main support member being disposed in a generally horizontal position, said main support member including vertically disposed spaced support sections, an upper horizontal section connecting said main vertical support sections, opposed horizontally disposed lower support sections extending from said main vertical support sections toward one another but terminating short thereof to provide a longitudinal opening therebetween, an elongated intermediate support member telescoping into said main support member, said intermediate support member including vertically disposed, spaced support sections, a plurality of roller means mounted on said intermediate vertical support sections, said roller means being rotatable on horizontal shafts extending from said intermediate vertical support sections, certain of said roller means extending slightly above the top edges of said intermediate vertical support sections and other of said roller means extending slightly below the bottom edges of said intermediate vertical support sections, an elongated inner support member having a generally T-shaped cross section with the top portion of the T member being disposed in a generally horizontal position, said inner support member telescoping into said intermediate support member, the horizontal portion of said T member having a thickness slightly smaller than the vertical spacing between said upper and lower roller means of said intermediate support section, said vertical portion of said T member having a thickness slightly smaller than the spacing between said opposed spaced horizontal lower support sections of said main support member, and mechanism for suspending a gate below said inner support member, whereby a gate suspended below said inner support member can be moved from a position below said main support member to a position to one side of said main support member.

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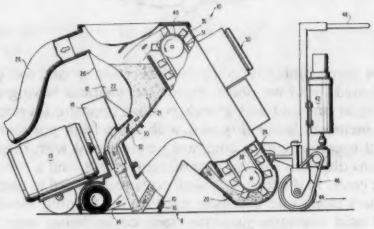
4,336,671
SURFACE CLEANING APPARATUS
Robert T. Nelson, P.O. Box 763, Oklahoma City, Okla. 73101
Filed Apr. 25, 1980, Ser. No. 143,731
Int. Cl.³ B24C 3/06
U.S. Cl. 51—424 7 Claims



1. A surface-treating apparatus comprising:
an enclosure having an opening adapted to be positioned adjacent a surface to be treated and expose the surface to said enclosure;
propelling means for propelling abrasive in a path through said opening of said enclosure against an exposed portion of the surface;
a blast chamber defined by said enclosure in communication with said opening;
means for recovering abrasive propelled against said exposed surface and rebounded therefrom;
means for recovering abrasive on said exposed portion of the surface by moving said abrasive into said path; and
said means for recovering said abrasive on an exposed portion of the surface including brush means located within said blast chamber for directing abrasive on an exposed portion of the surface into said path for said abrasive from said propelling means.

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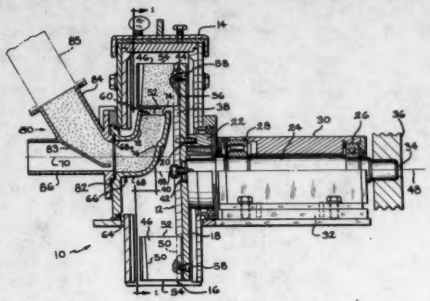
4,336,672
CENTRIFUGAL BLASTING APPARATUS
William S. Kwolek, Manchester, Mich., assignor to Ervin Industries, Inc., Ann Arbor, Mich.
Filed Apr. 21, 1980, Ser. No. 141,947
Int. Cl.³ B24C 7/00
U.S. Cl. 51—432 4 Claims

1. In a centrifugal blasting machine, a rotatably supported member having a plurality of outwardly extending abrasive impelling blades projecting therefrom, the inner ends of said blades terminating at positions spaced a uniform and predetermined distance short of the axis of rotation of said member so as to define an abrasive supply space between the inner ends of said blades, a tubular member extending into said supply space for delivering abrasive to the inner ends of said blades, said tubular member having an axis generally parallel to said axis of rotation and spaced radially outwardly therefrom, an extension on the inner end of said tubular member extending radially

outwardly relative to said tubular member axis and said axis of rotation and terminating in a closely spaced relation with the



inner ends of said blades, and means for delivering air under pressure and abrasive to said tubular member.

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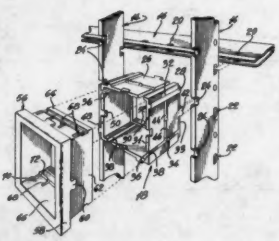
4,336,673

## MOSAIC DISPLAY PANEL

Gaston Duchesne, Quebec; Marc Laflamme, Bellechasse, and Denis Matte, Ste-Foy, all of Canada, assignors to Monitronik Ltee., Quebec, Canada

Filed Sep. 5, 1980, Ser. No. 184,621
Int. Cl.[3] E04F *19/00*; G12B *9/08*; E04F *13/00*
U.S. Cl. 52—27 8 Claims



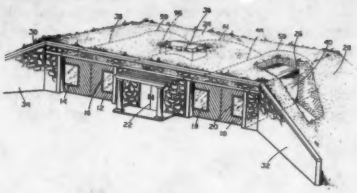
1. In a mosaic display panel formed of horizontal and vertical supports and of a mosaic of tiles and control instruments, a cluster of interfittingly connected elements for mounting said tiles and control instruments to said vertical supports; each mounting element being formed of side walls, each side wall including front, rear and side edges; said rear edge having means engageable with said vertical supports; said front edge having means engageable with said tiles or said control instruments; each said side wall having an outer face displaying thereon a longitudinal projecting tab distanced from one of said side edges of said side wall and a longitudinal guideway distanced from the other of said side edges; said tab and said guideway being substantially complementary in shape so that the tab and guideway of said side wall may be respectively inter-connected with the guideway and tab of the side wall of an adjacently disposed mounting element whereby said cluster of mounting elements may be formed and mounted to two adjacent vertical supports.

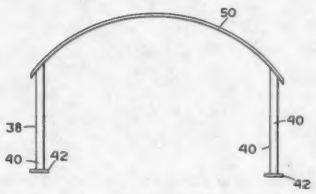
4,336,674

## UNDERGROUND STRUCTURE FOR RESIDENTIAL AND BUSINESS USE

Raymond C. Weber, P.O. Box 108, Ligonier, Ind. 46767

Filed Aug. 24, 1979, Ser. No. 69,281
Int. Cl.[3] E04H *9/00*; E02D *29/00*
U.S. Cl. 52—169.6 8 Claims






1. A subsurface construction including at least one uncovered apertured wall, additional load-bearing walls located at a subsurface level and extending below ground surface to be surrounded by earth on at least two sides of said construction, an unstressed arched roof extending between two of the load-bearing walls and forming between the confronting arches a channel for directing water in each of opposite directions to drain water to a location beyond the outlines of the construction, an overhead layer of earth above the roof line to completely encompass the structure with an earthen layer on at least two sides of the structure, an inverted T-shaped means carried on an internal wall for bracing the roof structure between arch spans by opposing the tendency of the arched span ends to expand under the weight of the overhead earth and providing a common vertical support therefor, elongated pipe drainage means for conducting water away from the vicinity of the base of the structure and away from the roof structure, said roof structure being ribbed with corrugations extending throughout the entire length of the weight-supporting roof spans and being scalloped throughout the entire roof line thereof, said ribbed corrugations radiating from the horizontal axis of the roof structure and being in communication with said water drainage means to direct water from between the earth and the arched roof, and an arcuate cross section member extending across the intersection of the arch spans providing a support surface for said elongated pipe means and to shield the intersection against infiltration of water.

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4,336,675

## CONSTRUCTION SYSTEM

Marcel Pereira, 1605 Croissant Donnacona, Duvernay, Laval, Quebec, Canada

Continuation of Ser. No. 794,254, May 5, 1977, abandoned. This application Sep. 29, 1980, Ser. No. 191,874
Int. Cl.[3] E04B *1/00*
U.S. Cl. 52—267 3 Claims

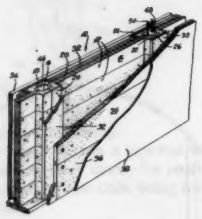
1. For use in a building structure including a supporting floor, and a load-bearing wall construction comprising:

a plurality of manually-portable, preformed wall members comprising a relatively thin web integral, at opposite ends, with a symmetrically-disposed, transverse wall from

which project spaced legs parallel to the web forming both vertically and outwardly opening channels, said legs, wall and webs extending vertically and being co-extensive in height, each wall member comprising a manually-portable module permitting the wall to be manually erected by workmen,

the modules having a height-to-length ratio between 1:5 and 1:25,

the wall comprising modules lying on edge one-on-top-of-the-other, with the vertically opening channels being in vertical alignment, and vertically-open channels of next adjacent modules being in abutment with and opening into open channels of next adjacent modules and forming therewith vertically extending chambers extending the height of the wall structure, interior and exterior cladding



juxtaposed on and secured to outer and inner surfaces of the module legs and forming on opposite sides of the webs spaces for receiving insulation and utilities, portions of said cladding projecting vertically beyond the vertically-extending chambers at said channels, said exterior cladding being of a height greater than the height of said modules and overlapping adjacent horizontal margins of said modules forming the wall construction for stabilizing the same; and

concrete poured into said vertically extending chambers and between said cladding beyond said vertically extending chambers and forming an integrating concrete connection in the vertically extending chambers and thereabove to provide a crown for a floor and to integrate the modules at the load-bearing wall.

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**4,336,676**

## COMPOSITE STRUCTURAL PANEL WITH OFFSET CORE

**Richard F. Artzer, Riverside, Calif., assignor to Covington Brothers, Inc., Fullerton, Calif.**

**Continuation-in-part of Ser. No. 857,235, Dec. 5, 1977, Pat. No. 4,226,067. This application Mar. 26, 1979, Ser. No. 23,590**

**Int. Cl.³ E04C *2/26***

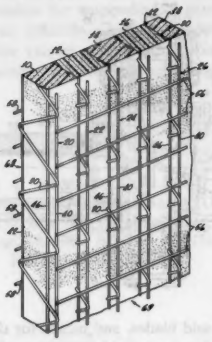
**U.S. Cl. 52—309.7** **26 Claims**

1. A method of making a reinforced panel comprising the steps of:

stacking a plurality of elongated filler elements and a plurality of substantially flat lattice structures in consecutive alternation with sides of said filler elements spaced inwardly of laterally outermost portions of said lattice structures,

fixedly securing said lattice structures to one another, and

laterally shifting at least a portion of each of a group of said filler elements outwardly to a displaced position in which outer sides of said shifted portions at one side of said panel



are positioned substantially at said lateral outer portions of said lattice structures at said one panel side.

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**4,336,677**

## ARRANGEMENT FOR PRESTRESSED ASSEMBLY OF MACHINE AND BASE-MODULES

**Carl G. R. Ossbahr, Brahegatan 5 A S-722 16, Västerås, Sweden**

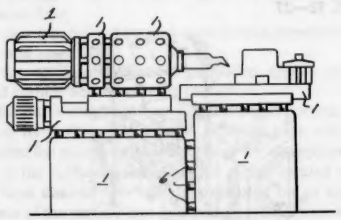
**PCT No. PCT/SE79/00160, § 371 Date Mar. 31, 1980, § 102(e) Date Mar. 27, 1980, PCT Pub. No. WO80/00322, PCT Pub. Date Mar. 6, 1980**

**PCT Filed Jul. 19, 1979, Ser. No. 190,856**

**Claims priority, application Sweden, Jul. 31, 1978, 7808285**

**Int. Cl.³ E04C *1/10***

**U.S. Cl. 52—584** **8 Claims**



1. An assembly formed from two or more base modular elements having faces capable of being attached to and disconnected from one another in parting planes locatable in a cartesian, three-dimensional system of co-ordinates, the said parting planes each being parallel to two axes in the co-ordinated system and intersecting points along the third axis defined by a modular element length in the co-ordinate system, each modular element comprising a plurality of load-bearing devices by means of which the said elements are attached to one another with their faces abutting to form an integral assembly where the elements are incrementally displaceable and rotatable in discrete geometric positions, the improvement comprising said load-bearing devices each having a circular conical concave abutment face with the apex of the conical face pointing toward said respective element, the center axis of the conical face being at a right angle to the parting plane so that the position of the center axis of the conical face in the co-ordinate system is defined by the fact that it intersects the parting plane at a co-ordinate point defined by the co-ordinates: $(a-\frac{1}{2})\cdot M$; $(b-\frac{1}{2})\cdot M$; where $a$ and $b$ are integers and M is the length of the modular element, the said conical abutment face being located on the respective modular elements so that when two modular

elements are assembled with one another, a gap results between the opposing conical abutment faces of the adjacent elements, said gap being of a size to permit insertion of a position-setting spacer member so that said spacer member contacts the opposing conical abutment faces of the two modular elements.

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**4,336,678**

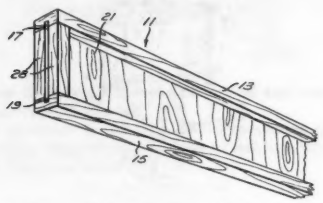
## I-BEAM TRUSS STRUCTURE

**Dierk D. Peters, P.O. Box 137, Rancho Sante Fe, Calif. 92067**

**Continuation-in-part of Ser. No. 927,618, Jul. 24, 1978, abandoned. This application Jul. 26, 1979, Ser. No. 60,908**

**Int. Cl.³ E04C *3/14***

**U.S. Cl. 52—729** **12 Claims**




1. A web-type wooden truss comprising:

a pair of spaced wooden chords each including a straight groove facing and in registration with the groove of the other chord, said grooves containing glue; and

a web member having opposite edges fitting within said chord grooves, said edges having undulating cross-sections in a direction parallel to the length of said grooves to provide, in cooperation with said grooves, individual glue dispersion pockets which evenly distribute the glue in the web/chord interface, said edge cross-sections undulating between a more acutely tapered edge having a more acute taper than the taper of said grooves and a less acutely tapered edge having a less acute taper than the taper of said grooves.

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**4,336,679**

## FILM WEB DRIVE STRETCH WRAPPING APPARATUS AND PROCESS

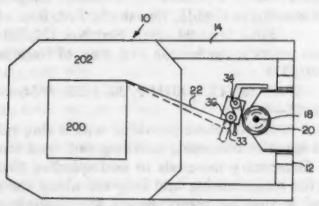
**Patrick R. Lancaster, Anchorage, and William G. Lancaster, Louisville, both of Ky., assignors to Lantech Inc., Louisville, Ky.**

**Division of Ser. No. 96,384, Nov. 21, 1979, Pat. No. 4,302,920. This application Dec. 11, 1980, Ser. No. 215,249**

**The portion of the term of this patent subsequent to Dec. 1, 1998, has been disclaimed.**

**Int. Cl.³ B65B *13/04***

**U.S. Cl. 53—399** **17 Claims**




1. A process for wrapping a web of stretchable film material around a package comprising:

a. placing a roll of stretchable plastic material on a ring mechanism;

b. withdrawing the leading end of said web of plastic material from said roll through elongation means comprising an upstream roller means and a downstream roller means mounted on said ring mechanism; the roller means of said assembly being interconnected and positioned to extend across the web width of the stretchable material to engage the plastic material;

c. holding the leading end of said web of stretchable plastic material adjacent a package;

d. rotating said ring around said package causing said plastic material to be pulled through said elongation means to drive said roller means;

e. elongating said stretchable plastic material by pulling said web of material past the interconnected roller means of said roller assembly proportionally driving the roller means by the engagement of the moving web so that the downstream roller means controls the upstream roller means at a speed less than the downstream roller means causing the film web to be substantially elongated between the upstream and downstream roller means; and

f. wrapping said substantially elongated web around said load with a force less than the maximum force incurred between the rollers.

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**4,336,680**

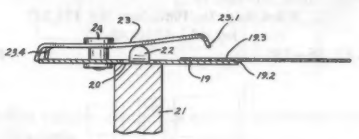
## STAINLESS STEEL TRANSPORT BAND

**John J. Grevich, Star Prairie, Wis., assignor to Nordson Corporation, Amherst, Ohio**

**Filed Jan. 4, 1980, Ser. No. 109,657**

**Int. Cl.³ B65B *41/14***

**U.S. Cl. 53—389** **1 Claim**




1. In a machine for packaging items of goods,

means for supplying a web of plastic film into the machine and carrier means for gripping and horizontally conveying the web of plastic film for carrying the items thereon, the carrier means including an elongate endless steel band with a top run to support the web of plastic film being conveyed, the band having a multiplicity of clips thereon releasably gripping the edge of the web of plastic film and carrying the film with the band through the machine, each of the clips having a jaw confronting and bearing against the steel band to clamp the film onto the band, and the band having a multiplicity of apertures therethrough each adjacent a respective clip, a sprocket wheel at one end of the top run of the endless band and mounting the band for travel as the sprocket is revolved, the sprocket having a plurality of protrusions each projecting through a respective aperture of the band and bearing against the clip and urging the clip away from the band to open the jaw and allow movement of the web of plastic film between the jaw and the band.

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**4,336,681**

## METHOD OF TRANSFERRING STRIP-LIKE PLASTICS BAG MATERIAL IN PACKING MACHINE

**Masami Onishi, Tokyo, Japan, assignor to Taiyo Shokai Co., Ltd., Japan**

**Filed May 16, 1980, Ser. No. 150,360**

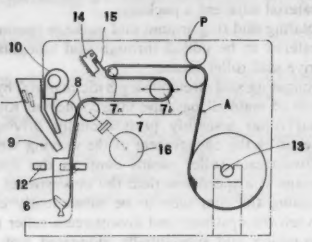
**Claims priority, application Japan, May 17, 1979, 54-59668**

**Int. Cl.³ B65B *43/12***

**U.S. Cl. 53—459** **4 Claims**

1. A method of transferring a strip-like plastic bag material in a packing machine, comprising the steps of: transferring the bag material by a pair of intermittently operated pinching rollers, said bag material comprising a series of interconnected bags each having a heat-sealed bottom portion with a flap-like

margin; raising said flap-like margin during transfer of said bag material by guide means; detecting said bottom portion by means of a microswitch having an elongated contact adapted to be releasably engaged with said flap-like margin as said



flap-like margin is raised by said guide means during transfer of said bag material; and stopping said bag material for packing operation in response to detection by said microswitch of said bottom portion.

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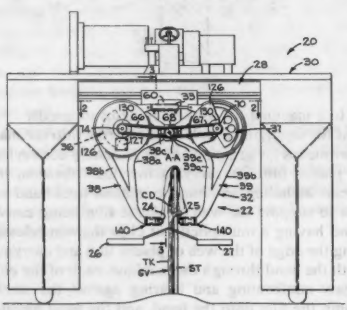
**4,336,682**

## CONTINUOUS HARVESTER FOR PLANTS GROWN IN ROWS

**Franklin P. Orlando, Morgan Hill, Calif., assignor to FMC Corporation, Chicago, Ill.**

**Filed Aug. 15, 1980, Ser. No. 178,327**
**Int. Cl.³ A01D** *46/26*
**U.S. Cl. 56—330** **18 Claims**



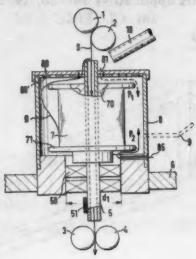
1. An harvester for plants that are grown in rows, such as grapevines, comprising: a harvester vehicle that is adapted to straddle a row of plants to be harvested as it is driven down the row, a shaker assembly suspended from the harvester vehicle for continuously harvesting the plants as the vehicle is driven down the row, the shaker assembly including a front shaker frame section, a separate rear shaker frame section, means for pivotally mounting the front and rear shaker frame sections to the harvester vehicle for independent and free rotation about a generally horizontal axis that is above the plants in the row and that is parallel to the direction of the travel of the vehicle, a pair of elongated striker members with one member being movably secured to portions of said front and rear frame sections on one side of said axis and the other striker member being movably secured to said front and rear sections on the other side of said axis, and means for oscillating the front and rear shaker frame sections to cause striker members attached thereto to impart a varying shaking action on a plant in the row as the harvester is driven forwardly relative to the plant by causing the front portions of the elongated striker members to move transversely of said axis and out-of-phase with the rear portions of said striker members.

**4,336,683**

## MECHANISM FOR THE PRODUCTION OF A WRAPPED YARN

**Erich Bock; Burkhard Wulfhorst, both of Ingolstadt; Eugen Hini, Lenting, and Bernhard Grupp, Ingolstadt, all of Fed. Rep. of Germany, assignors to Schubert & Salzer**

**Filed Jan. 21, 1980, Ser. No. 113,507**
**Claims priority, application Fed. Rep. of Germany, Jan. 23, 1979, 2902404**
**Int. Cl.³ D02G** *3/36;* **D01H** *7/18, 11/00*
**U.S. Cl. 57—18** **8 Claims**



1. A mechanism for the production of a wrapped yarn which consists of a bundle of spun fibers wrapped round by a binding thread, having a hollow spindle supported between a pair of delivery rolls and a pair of draw-off rolls, a rotating binding-thread bobbin arranged coaxial with the hollow spindle and a housing surrounding the binding-thread bobbin, said binding-thread bobbin having a radially extending flange adjacent a lower end thereof, said mechanism comprising:

means for stationarily supporting said housing relative to said rotating binding-thread bobbin;

a cover (**80**) closing said housing and having a hole (**81**) lying concentric with said hollow spindle (**5**);

an airflow ($P_2$) being fed into said housing (**8**) building the pressure in the region of said hole (**81**) to a level at least equal to the outside pressure surrounding said hole (**81**); and

at least one inlet air opening (**85**) through which said air flow ($P_2$) is fed which extends inside the housing (**8**) and lies with its mouth near to said bobbin flange (**71**) adjacent a lower end of said bobbin (**70**) remote from the cover (**80**) of the housing (**8**).

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**4,336,684**

## DRIVING ASSEMBLY FOR RING SPINNING OR TWISTING MACHINE

**Max Hartmannsgruber, Kirchheim, and Horst Wolf, Albershausen, both of Fed. Rep. of Germany, assignors to Zinser Textilmaschinen GmbH, Ebersbach, Fed. Rep. of Germany**

**Filed Mar. 24, 1980, Ser. No. 132,770**
**Claims priority, application Fed. Rep. of Germany, Mar. 23, 1979, 2911378**
**Int. Cl.³ D01H** *1/20, 1/22, 1/24*
**U.S. Cl. 57—93** **9 Claims**

1. In a textile machine provided with a ring rail, a bank of parallel spindles traversing said ring rail, feed means for supplying filamentary materials to said spindles, first a-c motor means for reciprocating said ring rail along the axes of said spindles, second a-c motor means for rotating said spindles about their axes, and third a-c motor means for driving said feed means,

the combination therewith of:

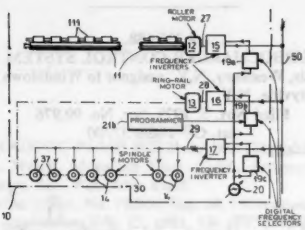
a power supply;

a first adjustable frequency changer inserted between said power supply and said first motor means;

a second adjustable frequency changer inserted between said power supply and said second motor means;

a third adjustable frequency changer inserted between said power supply and said third motor means;

first, second and third frequency selectors respectively connected to said first, second and third frequency changers for independently varying the frequency of an alternating




current fed thereby to said first, second and third motor means, respectively; and

a pulse generator in the form of a free-running oscillator delivering identical timing signals to said first, second and third frequency selectors.

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**4,336,685**

## SYNTHETIC POLYMER FILMS AND FIBERS RENDERED PERMANENTLY ANTI-STATIC

**Stephen E. Eisenstein, Oak Park, Mich., assignor to BASF Wyandotte Corporation, Wyandotte, Mich.**

**Filed Mar. 30, 1981, Ser. No. 249,097**

**Int. Cl.³ B29C** *25/00;* **B29D** *7/20;* **D02G** *3/02, 3/04*

**U.S. Cl. 57—238** **19 Claims**

1. The process of producing a synthetic polymer film or textile fiber or filament having improved antistatic properties by the steps comprising:

(A) admixing a hydrophobic, film- or fiber-forming synthetic polymer with about 5 to about 50 percent by weight, based upon the total weight of said polymer, of a sulfur-containing polyester containing repeating carbonyloxy units wherein said units are an integral part of the polymer chain, said polyester comprising the reaction products of (1) a diol or polyglycol, (2) a polycarboxylic acid, and (3) an organic reactant containing a metal salt of a sulfonic acid attached to an aromatic nucleus through an aliphatic or cycloaliphatic chain and ester linkage, said sulfur-containing polyester containing about 5 mole percent to about 50 mole percent, based upon the sum of the theoretical mole percentages of the other carboxylic acid components of said polyester, of at least one organic reactant containing the alkali metal sulfonate group, wherein said organic reactant consists of the at least monofunctional reaction product of an aromatic polycarboxylic acid, anhydride, or derivative thereof and an aliphatic or cycloaliphatic hydrocarbon hydroxysulfonic acid metal salt to form an extrudable mixture, thereafter

(B) extruding a film or textile fiber, and subsequently

(C) exposing said film or textile fiber to an aqueous solution containing about 0.05% to about 2% by weight, based upon the total weight of said sulfur-containing polyester present in said film or textile fiber, of a polyvalent metal ion reactive with the sulfate groups present in said sulfur-containing polyester.

10. The process of claim 1, 2 or 6 wherein said polyvalent metal ion is selected from the group consisting of at least one of $Ca^{++}$ $Co^{30+}$, $Co^{+++}$, $Al^{+++}$, $Mg^{30+}$, and $Fe^{+++}$ ions.

11. An antistatic film or textile fiber, filament or yarn which is the product of the process of claims 1, 2, or 6.

12. An antistatic textile yarn comprising the antistatic synthetic polymeric fiber produced by the process of claim 10 wherein said yarn is prepared from spun or continuous filament fiber selected from the group consisting of at least one of poly(ethylene glycol terephthalate), polyolefin, polyamide, polyacrylate, and polyacrylamide; or said fiber in combination with a natural fiber consisting of at least one of cotton and wool.

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**4,336,686**

## CONSTANT VOLUME, CONTINUOUS EXTERNAL COMBUSTION ROTARY ENGINE WITH PISTON COMPRESSOR AND EXPANDER

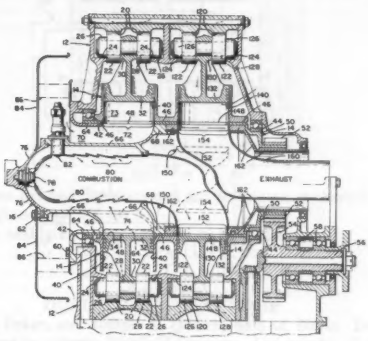
**Kenneth W. Porter, Mercer Island, Wash., assignor to Combustion Research & Technology, Inc., Seattle, Wash.**

**Filed Apr. 21, 1978, Ser. No. 898,915**

**The portion of the term of this patent subsequent to May 29, 1998, has been disclaimed.**

**Int. Cl.³ F02G** *3/02*

**U.S. Cl. 60—39.63** **40 Claims**




1. Constant volume, continuous external combustion rotary engine, comprising:

(a) an external housing including stationary continuous internal generally symmetrical drive cam track which is generally shaped to define lobes to effect alternate movement of a piston to at least two of an outer dead center and to two of an inner dead center position at predetermined degrees,

(b) a rotatable cylinder block within said housing containing (1) at least one bank of radially disposed cylinders numbering at least two defining a compressor section and at least one bank of radially disposed cylinders numbering at least two to define an expander section, (2) said cylinder block further including pistons within said cylinders for reciprocating radial movement and said pistons having connector sections with cam follower means thereon for engaging said drive cam track means, (3) said cylinder block also including a generally cylindrical inner wall enclosing said cylinders to define a cylinder cavity within each cylinder, said inner wall also including opening means of predetermined size, shape and location for each cylinder for the selective intake and release of air and gases, said rotatable cylinder block having a power output means connected thereto,

(c) a stationary manifolding and combustion assembly within said cylinder block inner wall, including (1) a compressor portion having air inlet passage and opening means for directing air to at least one first cylinder in said compressor bank at given degrees of rotation of the block and also having compressed air passages and openings for directing compressed air away from said first cylinders at given degrees of rotation of the block, said assembly also including (2) a fuel combustion chamber within said manifolding and combustion assembly for receiving said compressed air and further including fuel igniter and fuel injection means for continuous combustion of the air and fuel mixture within said combustion chamber, (3) an expander portion including hot gas passage and opening means for

directing hot gases to said second cylinders in said expander bank during predetermined degrees of rotation of said block and also having exhaust opening and passages for exiting expanded and spent gases away from said second cylinder and out of said engine.

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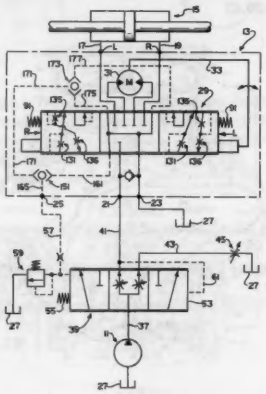
## 4,336,687
## LOAD SENSING CONTROLLER

David F. Morgan, Minnetonka, Minn., assignor to Eaton Corporation, Cleveland, Ohio

Filed Apr. 21, 1980, Ser. No. 142,526
Int. Cl.³ B62D 5/08
U.S. Cl. 60—384 13 Claims



1. A controller operable to control the flow of fluid from a source of pressurized fluid to a fluid pressure operated device of the type which may be subjected to overrunning loads, the source of fluid including pressure responsive means for varying the delivery of fluid to said controller in response to the variations in demand for fluid by said controller, said controller comprising:

(a) housing means including an inlet port for connection to the source of fluid, a return port for connection to a reservoir, first and second control fluid ports for connection to the fluid pressure operated device, and a load signal port for connection to the pressure responsive means;

(b) valve means disposed in said housing means and defining a neutral position and an operating position;

(c) said housing means and said valve means cooperating to define a first fluid path communicating between said inlet port and said first control fluid port and a second fluid path communicating between said second control fluid port and said return port when said valve means is in said operating position;

(d) fluid-actuated means for imparting follow-up movement to said valve means proportional to the volume flow of fluid through said first fluid path, said first fluid path flowing through said fluid-actuated means;

(e) said first fluid path including a first variable flow control orifice having its minimum flow area when said valve means is in said neutral position and an increasing flow area when said valve means is in said operating position;

(f) said second fluid path including a second variable orifice having its minimum flow area when said valve means is in said neutral position and an increasing flow area when said valve means is in said operating position;

(g) shuttle valve means disposed within said housing means and having first and second shuttle inlets and a shuttle outlet connected to said load signal port;

(h) means operable to communicate a first load signal from said first fluid path, downstream of said first variable flow control orifice, to said first shuttle inlet; and

(i) means operable to communicate a second load signal from said second fluid path to said second shuttle inlet to insure that the pressure responsive means is responsive to whichever of said first and second fluid paths is at a higher load pressure.

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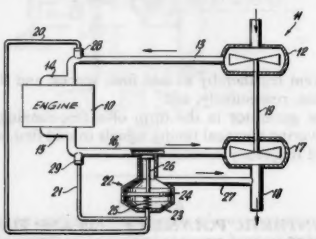
## 4,336,688
## TURBOCHARGER CONTROL SYSTEM

Fred J. Dellis, Westbury, N.Y., assignor to Windblown Systems, Inc., Amityville, N.Y.

Filed Nov. 5, 1979, Ser. No. 90,976
Int. Cl.³ F02B 37/00
U.S. Cl. 60—602 4 Claims




1. In an internal combustion engine having an intake manifold, an exhaust manifold and an exhaust driven turbocharger for compressing the intake charge, said turbocharger including a wastegate for limiting the boost pressure to a predetermined value, a pneumatic chamber for controlling said wastegate, the improvement comprising:

a first control line coupled for fluid communication between said intake manifold and said pneumatic chamber of said wastegate;

a second control line coupled for fluid communication between said exhaust manifold and said pneumatic chamber of said wastegate;

said first control line communicating the pressure within said intake manifold to said pneumatic chamber, said second control line communicating the pressure within said exhaust manifold to said pneumatic chamber;

said first and second control lines being constructed and arranged so as to be capable of fluid communication with each other to thereby effect a third pressure acting on said pneumatic chamber to thereby control said wastegate.

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## 4,336,689
## PROCESS FOR DELIVERING LIQUID CRYOGEN

Robert B. Davis, Nyack, N.Y., assignor to Union Carbide Corporation, Danbury, Conn.

Filed Jul. 10, 1981, Ser. No. 282,256
Int. Cl.³ F17C 7/02
U.S. Cl. 62—55 2 Claims

1. A process for delivering a liquid cryogen to a use point in an essentially liquid phase at an about constant flow rate in the range of about 1 to about 40 pounds per hour, said use point having a variable internal pressure drop, comprising the following steps:

(i) providing said liquid cryogen at a line pressure in the range of about 4 to about 10 times the maximum use point operating pressure;

(ii) subcooling the liquid cryogen of step (i) to an equilibrium pressure of no greater than about one atmosphere while maintaining said line pressure;

(iii) passing the liquid cryogen of step (ii) through a device having a flow coefficient in the range of about 0.0002 to about 0.005 while cooling said device externally to a

temperature, which will maintain the liquid cryogen in essentially the liquid phase; and

(iv) passing the liquid cryogen exiting the device in step (iii) through an insulated tube having an internal diameter in the range of about 0.020 inch to about 0.200 inch to the use point.

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**4,336,690**

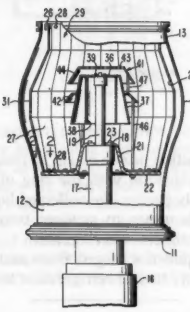
## CRYOGENIC PUMP WITH RADIATION SHIELD

**Kimo M. Welch, Mountain View, Calif., assignor to Varian Associates, Inc., Palo Alto, Calif.**

**Continuation of Ser. No. 79,860, Sep. 28, 1979, abandoned. This application Feb. 17, 1981, Ser. No. 234,512**

**Int. Cl.³ B01D *8/00***

**U.S. Cl. 62—55.5** **10 Claims**



**1.** In a cryogenic pump for removing gaseous species from a chamber: a first stage having an inlet opening at one end thereof for gaseous communication with the chamber and a generally cylindrical pumping surface maintained at a first temperature for removing a portion of the gaseous species, a second stage positioned coaxially within the first stage and having a pumping surface maintained at a temperature lower than the first temperature for removing an additional portion of the gaseous species, and a plurality of baffle members spaced axially apart between the first and second stages for shielding the pumping surface of the second stage from direct exposure to the inlet opening while permitting substantially unimpeded flow of the gaseous species from the inlet opening to the second stage.

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**4,336,691**

## CRYOJET RAPID FREEZING APPARATUS

**Neal L. Burstein, Stanford, and David M. Maurice, Atherton, both of Calif., assignors to The Board of Trustees of the Leland Stanford Junior University, Stanford, Calif.**

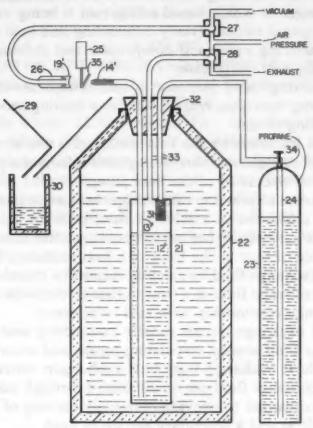
**Filed Dec. 13, 1979, Ser. No. 103,216**

**Int. Cl.³ F25D *17/02***

**U.S. Cl. 62—64** **17 Claims**

**1.** A process for rapid freezing of at least a portion of the surface of an object, comprising:

supplying a stream of quenchant cooled to, or close to, the freezing point thereof, said quenchant having a freezing point below about −80° C. and a temperature difference




between the melting point and the boiling point thereof of more than about 60° C.; and

directing said stream at the surface to be frozen.

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**4,336,692**

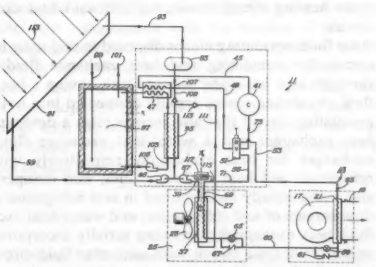
## DUAL SOURCE HEAT PUMP

**Amir L. Ecker, and Joseph A. Pietsch, both of Dallas, Tex., assignors to Atlantic Richfield Company, Los Angeles, Calif.**

**Filed Apr. 16, 1980, Ser. No. 140,706**

**Int. Cl.³ F25B *27/00*; F25D *21/10*; G05D *23/00***

**U.S. Cl. 62—82** **2 Claims**



**1.** Apparatus for conditioning a fluid temperature-wise and affording a single temperature hot water storage system for domestic using, defrosting, and supplying heat to a heat pump, comprising:

a. a hot water storage tank connected to conventional hot water inlet and outlet lines;

b. a fluid handler and fluid path means for circulating said fluid in a path in heat exchange relationship with a refrigerant fluid;

c. at least two refrigerant heat exchangers; a first of the heat exchangers being disposed in the path of the fluid such that the fluid is passed in heat exchange relationship therewith, and a second of the refrigerant heat exchangers being disposed in a heat exchange fluid circuit for circulating the refrigerant in heat exchange relationship with a heat exchange fluid and in heat exchange relationship with ambient air;

d. at least one compressor connected into a refrigerant circuit for efficiently compressing the refrigerant from its

inlet pressure to its discharge pressure under conditions of operation of the refrigerant circuit;

e. at least one metering valve connected at the inlet of a heat exchanger in which liquid refrigerant is being vaporized;

f. a refrigerant circuit serially connecting said heat exchangers, metering valve and compressor and defining a flow path for said refrigerant;

g. a reversing valve included in said refrigerant circuit for effecting operation respectively in a heating mode and in a cooling mode;

h. means for selecting the heat exchangers and direction of flow of refrigerant therethrough for selecting a particular mode of operation of the heat pump;

i. refrigerant disposed in said refrigerant circuit and adapted to be circulated in a selected flow path for transferring heat at a coefficient of performance greater than one;

j. a source of heat in the form of a heat exchange fluid;

k. heat exchange fluid circulating means for circulating said heat exchange fluid in a heat exchange circuit and in heat exchange relationship with said refrigerant;

l. a heat exchange circuit serially connecting said heat exchange fluid source, circulating means and second refrigerant-heat exchange fluid heat exchanger; whereby said heat exchange fluid can be circulated through said second heat exchanger to provide optionally melting of accumulated frost and a secondary source of heat;

m. temperature sensor disposed in said second heat exchanger to measure the temperature therewithin;

n. control means to energize said heat exchange fluid circulating means when the temperature measured in said second heat exchanger is less than 32° F. and to keep said heat exchanger fluid circulating means operative until the ice is melted from said second heat exchanger and the temperature in said second heat exchanger is above the freezing point of water whereby accumulated frost is detected and melted; said second heat exchanger having an ambient air circulation means for circulating ambient air past said second heat exchanger; and said control means including means for deenergizing said ambient air circulation means during defrosting;

o. solar heating circuit connected with said heat exchange circuit;

p. solar fluid circulating means disposed in said solar heating circuit for circulating said heat exchange fluid therethrough; said hot water storage tank having a hot water fluid circulating means serially connected in a hot water circulating circuit that also incorporates a desuperheater heat exchanger and a water-heat exchange fluid heat exchanger for heat exchanging respectively with hot refrigerant and heat exchange fluid; said desuperheater also being serially incorporated in said refrigerant circuit downstream of said compressor; said water-heat exchange fluid heat exchanger also being serially incorporated in said solar heating circuit with said solar fluid circulating means for heat exchange between said heat exchange fluid and said hot water; whereby a single temperature hot water storage serves optionally as a heat sink and a heat source to allow storing heat during periods of sun and using heat optionally for defrosting and for increasing efficiency of the heat pump.

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**4,336,693**

## REFRIGERATION PROCESS USING TWO-PHASE TURBINE

**Lance G. Hays, Los Angeles; Walter R. Studhalter, Woodland Hills, and Emil W. Ritzi, Manhattan Beach, all of Calif., assignors to Research-Cottrell Technologies Inc., Santa Monica, Calif.**

**Filed May 1, 1980, Ser. No. 145,470**

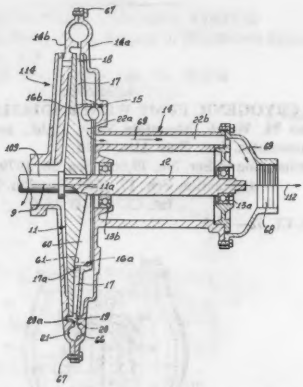
**Int. Cl.³ F25B *1/00***

**U.S. Cl. 62—116** **16 Claims**

1. In a refrigeration process employing a circulating fluid refrigerant, the process including compressing and cooling the refrigerant, expanding the cooled refrigerant to lower temperature and pressure levels, and then passing the expanded refrigerant through a refrigeration zone wherein heat is absorbed by the refrigerant, the steps that include

(a) carrying out said expansion through a first nozzle flow region to produce a liquid and vapor discharge,

(b) providing a rotor and collecting the liquid discharge in a ring on the rotor in such manner as to centrifugally pressurize the collected liquid,



(c) providing reaction nozzle means to rotate with the rotor and in communication with the ring of collected liquid and controllably passing the collected liquid through said reaction nozzle means to produce torque to rotate the rotor and to maintain said ring, and

(d) collecting liquid discharged from said reaction nozzle means for supply to said refrigeration zone.

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**4,336,694**

## SPRAYING SYSTEM FOR CRYOGENIC COOLANTS

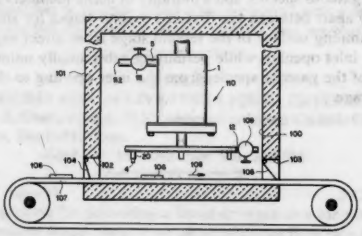
**Georg Schmitt, Höllriegelskreuth, and Georg Göstl, Neufahrn, both of Fed. Rep. of Germany, assignors to Linde Aktiengesellschaft, Höllriegelskreuth, Fed. Rep. of Germany**

**Filed Feb. 19, 1980, Ser. No. 122,248**

**Claims priority, application Fed. Rep. of Germany, Feb. 20, 1979, 2906480; Feb. 20, 1979, 2906488**

**Int. Cl.³ F25D *17/02***

**U.S. Cl. 62—374** **11 Claims**



1. A deep freezing system comprising:

an insulated chamber adapted to receive a product to be deep frozen;

a distribution pipe provided with at least one spray nozzle for a liquid cryogen, said spray nozzle having a passage formed by a cylindrical bore for said liquid cryogen extending downwardly from said pipe, and a downwardly opening slit-shaped elongate long and narrow orifice formed by a V-section groove intersecting said bore for discharging a spray of the liquid cryogen onto said product; and

means for feeding a liquid cryogen to said distribution pipe.

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**4,336,695**

## COMPRESSION REFRIGERATION UNIT ADJUSTABLE IN ACCORDANCE WITH THE LIQUID FLOWING OUT FROM THE EVAPORATOR

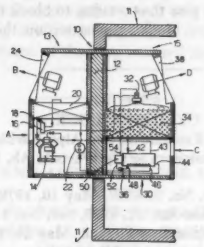
**Egidio Ceolotto, Varedo, Italy, assignor to Monseol Limited, Chiasso, Switzerland**

**Filed Jul. 23, 1980, Ser. No. 171,550**

**Claims priority, application Switzerland, Apr. 18, 1980, 3037/80; Jun. 16, 1980, 4595/80**

**Int. Cl.³ F25B *39/02***

**U.S. Cl. 62—504** **6 Claims**



**1.** In a compression type refrigerator, comprising a compressor, a condenser for cooling and condensing said fluid from said compressor, an expander for expanding the cooled fluid, and an evaporator for evaporating the expanded fluid; the improvement in which said expander comprises two expansion nozzles in parallel with each other, one said nozzle being fixed and the other said nozzle having an adjustable cross-sectional area, and means responsive to the amount of liquid leaving said evaporator to vary said cross-sectional area inversely as said amount.

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**4,336,696**

## TRIPOD TYPE CONSTANT VELOCITY UNIVERSAL JOINT

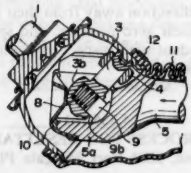
**Yoshifumi Tsukiyama, Okazaki; Yasunori Hatanaka, Toyota; Akiyoshi Ogawa, Nishikamo, and Hitoshi Mizutani, Aichi, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan**

**Filed Feb. 6, 1980, Ser. No. 119,155**

**Claims priority, application Japan, Feb. 9, 1979, 54-14804**

**Int. Cl.³ F16D *3/30***

**U.S. Cl. 464—111** **8 Claims**



**1.** A tripod type constant velocity universal joint, wherein a trunnion portion of tripod shafts fixed on a first shaft are urged against and supported by a tulip portion of a second shaft through a tripod spring, a mushroom-shaped member with a spherical head is provided in a mounting hole of said trunnion portion, said mushroom-shaped member is biased by a compression spring to keep the spherical head of said mushroom-shaped member in contact with a recess of said tulip portion, and the external configuration of the head of the mushroom-shaped member is formed in a manner that the distance from the center of the joint is increased as the point on the external configuration leaves from the center of the surface of said head toward the outer periphery of the head of the mushroom-shaped member.

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**4,336,697**

## METHOD OF AND MECHANISM FOR TRANSFERRING KNITTED FABRIC FROM A KNITTING MACHINE TO A MAGAZINE

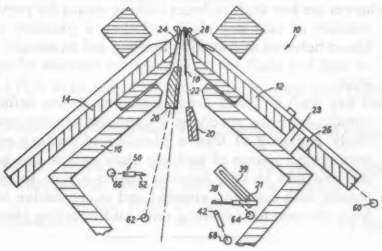
**Reinhards Vitols, 12 Sunningdale Dr., Tollerton, Nottinghamshire; Adrian M. Woodward, 22 Abbortsburg Close, Rise Park, Bulwell, Nottinghamshire; John E. Baker, 42 Park Rd., Birstall, Leicester, and Gordon R. Wray, Stonestack, Main St., Rempstone, Nottinghamshire, all of England**

**Filed Nov. 5, 1979, Ser. No. 91,190**

**Claims priority, application United Kingdom, Nov. 6, 1978, 43366/78**

**Int. Cl.³ D04B *9/40, 35/00***

**U.S. Cl. 66—148** **17 Claims**



**1.** A method of transferring a knitted fabric from the knitting needles of a flat knitting machine to the needles of a magazine bar comprising the steps of displacing one bed of the knitting machine a preselected distance from a position in which knitting takes place; moving a plurality of intermediate transfer elements into juxtaposition with the needles of said one bed and engaging each said element with a respective needle and transferring the knitted loops of said knitted fabric from the needles of said one bed to said elements; removing said elements from adjacent the needles of said one bed and into engagement with the needles of said magazine bar; and transferring the loops of the knitted fabric from said elements to the needles of said magazine bar.

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**4,336,698**

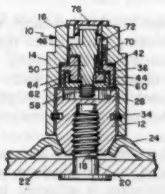
## LUG NUT LOCK

**Gary L. Hurd, 5870 Salacot Ct., San Diego, Calif. 92124**

**Filed Jul. 6, 1979, Ser. No. 55,691**

**Int. Cl.³ F16B *41/00*; E05B *27/08, 13/10***

**U.S. Cl. 70—231** **9 Claims**



**1.** A locking device comprising in combination:

a lug nut having a threaded bore threadably engaging a first member for securing a second member thereto, said lug nut having a generally cylindrical outer surface and being rotatable into and out of a securing position:

a sleeve having multiple stepped cylindrical bores rotatably mounted on and covering said cylindrical surface of said lug nut and an annular shoulder engaging the end of said nut, and annular retainer ring retaining said sleeve on said nut, said sleeve having a hex outer portion for engagement for rotation by a wrench for removal of said fastening element from said first member,

said nut including a substantially coaxial, hexagonal shaped bore formed therein, said sleeve includes a locking housing non-rotatably mounted within said sleeve, said housing having a cylindrical bore and an outer hexagonal configuration, said sleeve also including a coaxial bore formed therein of a hexagonal configuration, a threaded key shaft coaxially rotatably mounted in said housing cylindrical bore and rotatable by means of a key, and a coupling element having a hexagonal shaped outer portion coaxially threadably mounted on said key shaft and movable between a non-coupling position retracted within said bore in said sleeve and a coupling position within both said sleeve and said bore in said nut upon rotation of said key shaft a multiple number of turns,

wherein the key shaft includes locking means for preventing rotation of said key shaft including a plurality of pins biased between said locking housing and an annular flange on said key shaft for preventing the rotation of said key shaft;

said key shaft and said sleeve including means defining an annular bore for receiving an annular key for cooperatively engaging at least a plurality of locking pins for permitting rotation of said key shaft within said housing wherein said locking housing defines a skirt for encompassing said coupling element and is responsive to axial force thereon for crimping onto said coupling elements.

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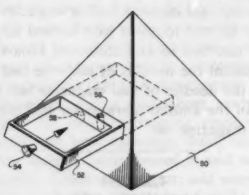
**4,336,699**

## SYSTEM FOR INTERLOCKING OBJECTS

**Robert D. Green, 423 University Village, Salt Lake City, Utah 84108**

**Filed Nov. 5, 1979, Ser. No. 91,047**
**Int. Cl.³ E05B *37/20*; A63H *9/00***
**U.S. Cl. 70—290** **7 Claims**



1. A system for interlocking objects comprising:

a polyhedron, adapted to be hand held, including:

a first locking channel located therein, one end of said locking channel originating at a surface of said polyhedron, and

at least one enclosed blocking channel, each blocking channel having a blocking pin inserted therein, each blocking channel originating and terminating within said polyhedron, and each channel orthogonally intersecting at least one other channel within said polyhedron, at least one blocking channel orthogonally intersecting said locking channel;

a drawer adapted to be inserted into said polyhedron such that the surface of said polyhedron where said first locking channel originates is adjacent to a surface of said drawer in which a second locking channel originates, said second locking channel being aligned with said first locking channel so that one serves as an extension of the other when said drawer is inserted into said polyhedron;

a locking pin inserted into one of said locking channels, said pin being dimensioned such that it may freely move longitudinally within said locking channels but may not move laterally therewithin; and

indirect force means for selectively moving said locking and blocking pins longitudinally within their respective locking and blocking channels, said force means making no direct physical contact with said pins, thereby allowing said locking pin to be positioned within said locking channels so that it simultaneously extends part way into said polyhedron and part way into said drawer when said drawer is inserted into said polyhedron and said locking channels are aligned, thus locking all lateral movement between the surfaces of said drawer and polyhedron, and thereby further allowing said blocking pins to be selectively positioned at the intersections of said channels, each of said blocking pins thus serving to block the movement of the locking or blocking pins within their respective channels.

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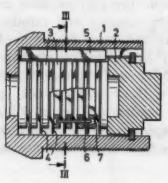
**4,336,700**

## CYLINDER LOCK

**Arne Baltscheffsky, Kauniainen, and Alpo Kärkkäinen, Kulbo, both of Finland, assignors to Oy Wartsila Ab, Helsinki, Finland**

**Continuation of Ser. No. 904,513, May 10, 1978, abandoned. This application Jan. 22, 1980, Ser. No. 114,369**
**Claims priority, application Finland, May 24, 1977, 771639**
**Int. Cl.³ E05B *29/00***
**U.S. Cl. 70—366** **22 Claims**



1. A cylinder lock comprising a lock mechanism with a mechanically positively guided function independent of any spring means, said mechanism comprising a non-rotatable cylinder housing having therein a key operated lock mechanism including a turnable cylinder and a plurality of locking discs which are turnable by a key and which, when being in a position allowing insertion of said key into said lock, hereinafter called zero position, keeps said lock mechanism in a locking position, thereby preventing said cylinder from turning relatively to said cylinder housing, said locking discs being turnable to a cylinder releasing position, said mechanism further including spring means operative to urge at least some of said locking discs in a direction away from their cylinder releasing position towards their zero position, said spring means being functionally redundant with respect to the normal function of said lock mechanism.

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**4,336,701**

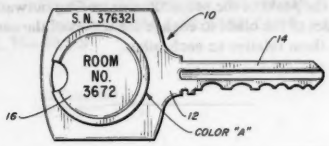
## KEYING PROCESS FOR RESETTABLE LOCK

**James W. Raymond, 1801 Port Margate Pl., Newport, Calif. 92660**

**Continuation of Ser. No. 723,938, Sep. 16, 1976, abandoned. This application Oct. 31, 1977, Ser. No. 847,080**
**Int. Cl.³ E05B *19/00***
**U.S. Cl. 70—395** **3 Claims**

1. A process for use in conjunction with resettable room locks in a hotel, motel, or the like, including: providing a plurality of keys each having a stem portion and a handle portion having an opening therein; providing identifying indicia on said keys; grouping said keys with duplicates having the same identifying indicia; providing a plurality of plug members all having the same room number inscribed thereon; causing

said plug members to be selectively removably retained in said opening in each of said key; causing said plugs to be replaced by one another each time a corresponding resettable room lock




is changed; causing each of said plugs to include means for distinguishing it from the other plugs; and indicating the current key for any resettable room lock as established by the distinguishing means of the plug inserted into the current key.

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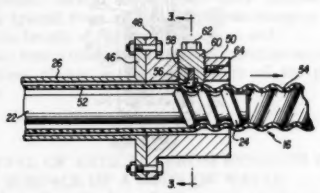
**4,336,702**

## METHOD OF AND APPARATUS FOR MAKING SPIRAL TUBES

**Juan J. Amado, Jr., Aptdo. 4241, Panama City, Panama**

**Filed Sep. 12, 1980, Ser. No. 186,658**
**Int. Cl.³ B21D *15/04***
**U.S. Cl. 72—75** **10 Claims**




1. A method of forming spiral tubes which comprises the steps of

a. providing a female spirally shaped die track on a rotatable shaft,

b. suspending only a single metal ball from a rotatable holder with said ball being positioned in registry with said die track,

c. inserting a tube to be formed between said die track and said metal ball,

d. clamping said tube to be formed so as to prevent rotation thereof while permitting axial movement of said tube,

e. advancing said metal ball to obtain a desired radial inward depression in said tube to be formed,

f. and rotating said rotatable holder and said rotatable shaft in unison to form a spirally-shaped groove in said tube.

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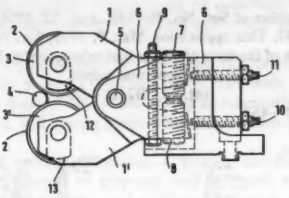
**4,336,703**

## TANGENTIAL ROLLING HEAD

**Diethard Thomas, Schwarzenbek, Fed. Rep. of Germany, assignor to Wilhelm Fette GmbH, Schwarzenbek, Fed. Rep. of Germany**

**Filed Oct. 30, 1980, Ser. No. 202,054**
**Claims priority, application Fed. Rep. of Germany, Nov. 8, 1979, 2944999**
**Int. Cl.³ B21H *3/04***
**U.S. Cl. 72—104** **14 Claims**

1. Tangential roller head for cold forming of screwthreads on rotary workpieces, comprising two threaded rollers arranged opposite each other on supporting means for free rotation about parallel axes, and unbalancing means provided on




respective rollers to rotate the same by the force of gravity into a predetermined starting position.

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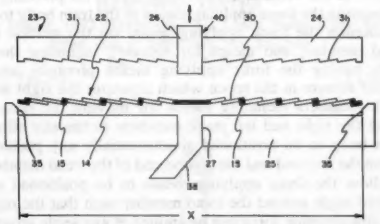
**4,336,704**

## APPARATUS FOR ORIENTING AND SIZING BATTERY GRIDS

**Jerry T. McDowell, Greeneville, Tenn., assignor to Ball Corporation, Muncie, Ind.**

**Division of Ser. No. 949,934, Oct. 10, 1978, Pat. No. 4,220,030.**
**This application Mar. 28, 1980, Ser. No. 134,830**
**Int. Cl.³ B21D *28/02, 28/32***
**U.S. Cl. 72—324** **1 Claim**



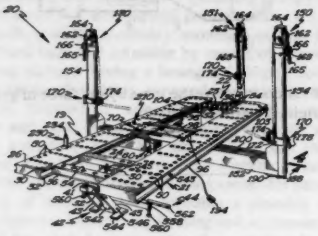

1. An apparatus for sizing and orienting grids having an open network section and a nonopen section, said open network section having nodes, said apparatus comprising opposing movable die plates having surfaces for engagement with grids disposed intermediate said plates, said plates being mounted on a frame, means for advancing the grids along a predetermined path and into an area intermediate said plates so that said grids are positioned for the sizing and orienting operation by said plates, means centrally mounted in said plates for cutting out a portion of the nonopen section and retaining the cut-out portion of a fixed position within said path, and means connected to said cutting means for advancing said cutting means and plates into engagement with said grids, said surface of at least one plate having an array of parallel inclined planes each plane connected by an array of single flat surfaces for making pressing contact with said nodes, wherein a cross section of said array of planes constitutes a substantially serrated configuration and the surface of the other plate being flat, said array pressing simultaneously while said nonopen section is being retained to work the nodes, moving said nodes outwardly and away from said nonopen section, said one of said plates provided with confining means proximate the periphery of said one of said plates and cooperating with said other plate to confine the grids during their outward movement to a given width to thereby size and orient said grids.

4,336,705

## APPARATUS FOR REPAIRING AND STRAIGHTENING

Gerald A. Specktor, 409 Cleveland Ave. South, St. Paul, Minn. 55105

Continuation of Ser. No. 496,848, Aug. 12, 1974, Pat. No. 4,151,737. This application Mar. 9, 1979, Ser. No. 18,959
The portion of the term of this patent subsequent to May 1, 1996, has been disclaimed.
Int. Cl.³ B21D 1/12
U.S. Cl. 72—457 25 Claims



1. Apparatus for repairing and straightening the body and frame of a wheeled vehicle comprising, in combination: a tread member having a first end and a second end and having a top surface and a bottom surface and including a right track member and a left track member, each of the right and left track members having a top surface formed thereon to allow support of the vehicle thereon; means for allowing placement of a vehicle upon the tread member; at least one means for applying a force to the vehicle; a tram body; means for pivotally interconnecting the force applying means to the tram body to allow positioning the force applying means on the outside of the tread member; and means for movably mounting the tram body having the force applying means pivotally interconnected thereto in the space which separates the right and left track members including means for moving the tram body along the right and left track members to thereby allow the tram body to be positioned at substantially any position between the first end and the second end of the tread member and to allow the force applying means to be positioned at any desired angle around the tread member such that the reparing and straightening force can be applied at any angle around the entire 360 degree periphery of the vehicle.

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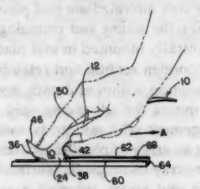
4,336,706

## LATHEKIN

Alberto A. Garcia, 6940 56th Ave. South, Seattle, Wash. 98118

Filed May 15, 1980, Ser. No. 150,001
Int. Cl.³ B21D 3/16
U.S. Cl. 72—479 11 Claims



1. A lathekin for opening the leaves which form the channel of came, which comprises:

(a) a blade having an elongated main edge insertable within the channel;

(b) a pair of peaked projections extending oppositely from the sides of the blade in a plane substantially normal to the plane of the blade, each having a sloping leading surface and a sloping trailing surface on either side of the peak extending along the blade adjacent to a portion of the edge, said sloping leading surfaces of the projections defining a point located substantially in the plane of the blade the peaks of the projections extending outward from the sides of the blade to engage the leaves of the came and space them relative to each other.

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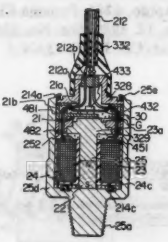
4,336,707

## KNOCK DETECTING APPARATUS FOR INTERNAL COMBUSTION ENGINES

Hiroaki Yamaguchi, Anjo; Tadashi Hattori, and Yoshinori Ootsuka, both of Okazaki, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed May 27, 1980, Ser. No. 152,986
Claims priority, application Japan, Jun. 4, 1979, 54-70495; Oct. 24, 1979, 54-138032
Int. Cl.³ G01L 23/22
U.S. Cl. 73—35 1 Claim



1. A knock detecting apparatus for an internal combustion engine comprising:

vibrating means having at least one resonant frequency within a knocking frequency range;

magnetic means arranged to form a magnetic path in association with said vibrating means, said magnetic path including a gap formed between said vibrating means and said magnetic means;

means connected to said magnetic means to generate magnetic flux in said magnetic path;

magnetically sensitive means connected to said magnetic means to sense a change in said magnetic flux in said magnetic path caused by the vibration of said vibrating means;

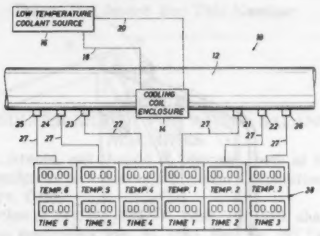
a housing secured to an internal combustion engine, said housing having said vibrating means, magnetic means, flux generating means and magnetically sensitive means mounted thereon, the housing including a side peripheral wall portion formed into a substantially cylindrical cup shape, said vibrating means being disposed within the housing such that the vibrating means has its lengthwise direction arranged in a diametrical direction of said housing, the magnetic means being disposed within the housing less remote from the engine than said vibrating means and arranged such that its lengthwise direction is along an axial direction of said housing, said housing further including plate means positioned within the housing so as to be more remote from the engine than said vibrating means, the housing and said plate means defining a space filled with damper means which surrounds the vibrating means so as to restrict the vibration thereof; and

heating means mounted on the plate means to heat the damper means through the plate means.

## 4,336,708
## PIPELINE LEAK LOCATOR

Terry W. Hobgood, 7726 Pella St., Houston, Tex. 77036, and James C. Knox, Jr., 7043 Concho, Houston, Tex. 77074

Filed Oct. 14, 1980, Ser. No. 196,618
Int. Cl.[3] G01M 3/00; G01N 25/00
U.S. Cl. 73—40.5 R 11 Claims




1. A device for locating leaks in a pipeline carrying a fluid comprising:

(a) means for changing the temperature of a pipeline section, said temperature changing means being selectably attachable at a selected location of the pipeline section;

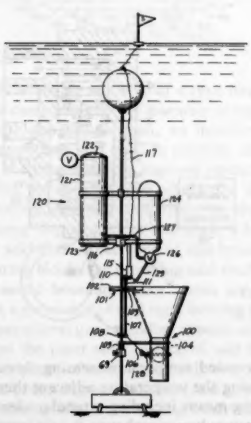
(b) a plurality of temperature sensors selectably attachable to the pipeline section, said temperature sensors being equally spaced from said temperature changing means along the length of the pipeline section; and

(c) monitor means connected to said temperature sensors for monitoring change in the temperature of the pipeline section.

## 4,336,709
## RETRIEVAL OF ARTICLES FROM BENEATH THE SURFACE OF A BODY OF WATER

Robert P. Meek, Santa Barbara, Calif., assignor to Ecomar, Inc., Goleta, Calif.

Continuation of Ser. No. 29,450, Apr. 12, 1979, abandoned. This application Nov. 19, 1980, Ser. No. 208,266
Int. Cl.[3] G01N 1/04
U.S. Cl. 73—61.2 6 Claims



1. Apparatus adapted to follow an upright cable beneath the surface of a body of water to a first depth, and later to rise to a lesser second depth, said apparatus comprising:

guide means adapted to embrace and slide along said cable;

a retrievable article mounted to said guide means for movement therewith, the combination of said guide means and article having a negative buoyancy so as to sink;

stop means, the depth of which is adjustable, and which can be rigidly attached to said cable to determine said first depth, said stop means restraining said article at said first depth;

buoyancy means adapted to slide along said cable comprising a body having a floodable cavity, said body when the cavity is flooded with water having an inherently negative buoyance, and having positive buoyancy when filled with gas;

attachment means comprising a magnet carried by said buoyancy means so disposed and arranged as to abut against and attach to said guide means when said buoyancy means sinks to the depth of said guide means;

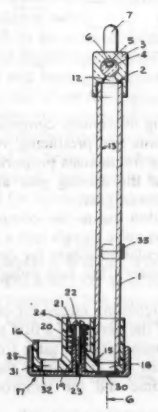
gas supply means carried by said buoyancy means comprising a compressed gas tank connected to said cavity;

gas valve means carried by said buoyancy means connected to said gas supply means to retain gas in said gas supply means until the gas valve means is opened, said gas valve means comprising an operator which is movable and so disposed and arranged relative to said guide means as to open said gas valve means by abutment force when said attachment means is magnetically attached to said guide means, whereby to release gas from said gas supply means to expel water from said cavity, the resulting positive buoyancy of said buoyancy means being adequate to cause the combination of article, buoyancy means, attachment means, guide means, gas supply means, and gas valve means to rise to said second depth.

## 4,336,710
## HARDNESS TESTER

Arthur Miller, 1602 Myrtlewood St., Costa Mesa, Calif. 92626

Filed Jun. 9, 1980, Ser. No. 157,533
Int. Cl.[3] G01N 3/52
U.S. Cl. 73—79 12 Claims



1. A hardness tester for testing the hardness of a surface of a test specimen, said hardness tester comprising:

a tubular element having upper and lower ends;

means for mounting the tubular element in a generally upright position;

a ball;

means on said tubular element for releasably retaining said ball above said lower end;

passage means extending from said retaining means through the tubular element and terminating in an opening adapted to be positioned over the surface of the test specimen;

said tubular element having a wall through which the pas-

sage means is visible from the exterior of the tubular element and indicia on said wall;

said ball having a lesser cross-sectional area than said passage means below the retaining means and a lesser cross-sectional area than said opening whereby the ball is sized to pass completely through said opening and when the ball is released from the retaining means, it falls by gravity through the passage means without touching the wall of the passage means and contacts the surface of the test specimen and rebounds from such surface, the height of said rebound being relatable to a known hardness value by means of said indicia; and

a collector, a base and means for rotatably mounting said collector on said base, said tubular element being mounted on said collector, said passage means extending through said collector and said base with said opening being in said base, said collector and said base being relatively rotatable to displace said opening from said passage means and to permit said base to at least partially close off the lower end of said passage means.

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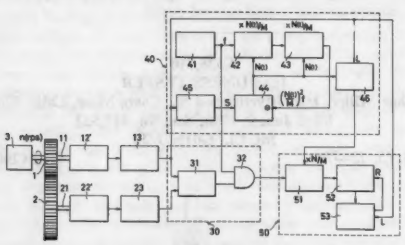
**4,336,711**

## GEAR MESH TESTING INSTRUMENTS

**Osamu Maehara, Kawasaki, and Tsutomu Harada, Yokohama, both of Japan, assignors to Ono Sokki Co., Ltd., Tokyo, Japan**

**Filed Nov. 27, 1979, Ser. No. 97,660**
**Claims priority, application Japan, Dec. 11, 1978, 53-153471**
**Int. Cl.³ G01M *13/02***
**U.S. Cl. 73—162** **3 Claims**



1. A gear mesh testing instrument comprising:

pulse producing means for producing two pulse signals respectively having frequencies proportional to the rotational frequency of the driving gear and the rotational frequency of the driven gear;

frequency compensation means for compensating the frequencies of the two pulse signals into a same frequency;

a time difference calculation means for detecting the phase difference time between the two pulse signals with the same frequency;

a reciprocal value calculating means for calculating out the reciprocal value of the period of a first pulse signal out of the two pulsed signals with the same frequency; and

a multiplication means for calculating the product of the phase difference time and the reciprocal value of the period.

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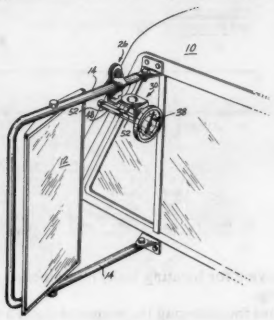
**4,336,712**

## VEHICULAR TEMPERATURE GAUGE

**Robert S. Hawkins, 3002 Cascade view Rd., Sumner, Wash. 98390**

**Filed Apr. 14, 1980, Ser. No. 139,897**
**Int. Cl.³ G01K *13/02***
**U.S. Cl. 374—138** **2 Claims**

1. A vehicular temperature gauge comprising a thermometer having a temperature-sensing rod element; a direct reading dial connected with said sensing rod and disposed at right angles thereto; an externally threaded nipple connected with said thermometer and coaxially disposed on said rod element; a first washer disposed on said rod element and disposed adjacent said thermometer; bracket means disposed on said threaded nipple and having two opposite surfaces, one surface thereof abutting said washer, said bracket means providing a unit for detachably mounting the thermometer on a vehicle; a second washer disposed on said rod element and disposed adjacent the opposite surface of the bracket means; an internally threaded tube surrounding said rod element in spaced relation thereto,



providing a chamber between it and the rod element, threadedly connected with the threaded nipple, and disposed to urge said second washer against the opposite surface of the bracket means, said tube being provided with means to connect the chamber with external air conditions; and readily detachable mounting means connected with said bracket and mounting said unit on the exterior of a vehicle and at a location within the area of the normal view of the operator of the vehicle.

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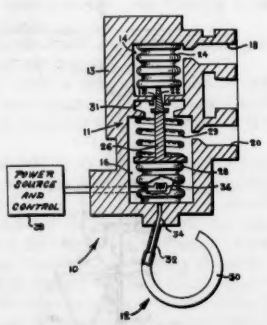
**4,336,713**

## COMPENSATED TEMPERATURE SENSING DEVICE

**Arthur S. Meyer, West Chester, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.**

**Filed Aug. 6, 1980, Ser. No. 175,794**
**Int. Cl.³ G01K *1/22***
**U.S. Cl. 374—197** **9 Claims**




1. A compensated temperature sensing device comprising means for sensing the temperature adjacent thereto, said temperature sensing means including a tubular element and a gas contained therein wherein a change in said temperature alters the pressure of said gas, said altered pressure providing a first signal responsive to said temperature change, means operably connected to said temperature sensing means for providing a second signal representative of said first signal, and means operably associated with said temperature sensing means and said second signal providing means for substantially increasing

the speed at which said second signal is indicative of said temperature change sensed by said temperature sensing means whereby said second signal virtually instantaneously provides an indication of said temperature change.

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**4,336,714**
**Patent Not Issued For This Number**

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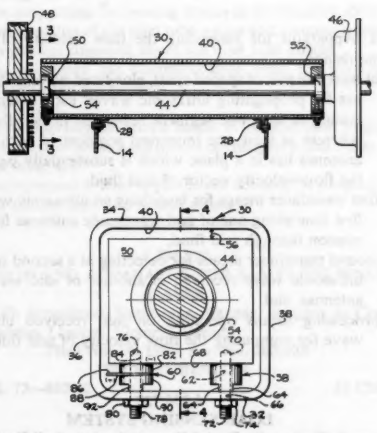
**4,336,715**
**TRANSDUCER MOUNT FOR WHEEL BALANCING MACHINES**

**Arthur K. Arnold, and Donald R. Sherman, both of San Jose, Calif., assignors to Autotron Equipment Corporation, Mountain View, Calif.**

**Continuation of Ser. No. 128,946, Mar. 10, 1980, abandoned. This application Aug. 31, 1981, Ser. No. 297,730**
**Int. Cl.³ G01M 1/22**
**U.S. Cl. 73—462** **4 Claims**



**1.** In a wheel balancing machine of a type having a driven shaft adapted to carry a wheel/tire assembly at one end thereof for rotation with the driven shaft, an improved mounting structure for supporting said shaft to provide electric signals representative of dynamic forces imposed thereon by weight imbalance during rotation of said wheel/tire assembly and shaft, said mounting structure comprising an elongate, rigid, multisided housing disposed about said shaft, a bearing block disposed about said shaft at each end of said housing, bearings within said bearing blocks for receiving said shaft for rotation with respect to said housing, spacer means supporting each said block from a given side of said rigid housing to provide an uninterrupted peripheral gap extending around said blocks and defined between the inner wall surface of said rigid housing and the outer periphery of said blocks exclusive of that portion of said outer periphery disposed adjacent said given side of said housing, said bearing blocks remaining otherwise decoupled from and independent of each other and of said housing to inhibit movement of one from effecting movement in the other, said spacer means comprising a pair of spacer units at each end of said rigid housing, each said pair including both an active and a passive spacer unit supporting a given one of said bearing blocks from said given side of said rigid housing and in spaced relation to the inner wall of said rigid housing, each said active unit including a force transducer for sensing dynamic imbalance forces applied thereto.

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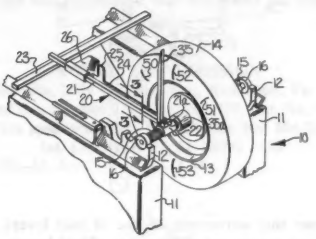
**4,336,716**
**WHEEL BALANCING DEVICE AND METHOD**

**Jerry P. Poppell, 3430 Willis Rd., Mulberry, Fla. 33860**

**Filed Dec. 8, 1980, Ser. No. 214,574**
**Int. Cl.³ G01M 1/12**
**U.S. Cl. 73—480** **6 Claims**



**1.** A device to facilitate the static balancing of a wheel which is mounted for free rotation about a generally horizontally extending axis, said device comprising

an elongate deflectable pointer,

means cooperating with one end of said pointer for mounting the pointer so as to extend in a cantilever manner alongside the wheel,

a scale mounted to cooperate with the elongate deflectable pointer at a location spaced from said one end thereof and having indicia thereon indicating the amount of weight needed to be added to the wheel in order to bring the wheel into balance, and

a finger adapted to be secured to the wheel at a selected circumferential location in relation to the heaviest point on the wheel and having a projecting portion extending laterally from the wheel for engaging and deflecting said pointer whereby the amount of deflection of the pointer can be read directly from the scale and the amount of weight needed to bring the wheel into balance can be readily determined, thus greatly reducing the amount of time required for balancing the wheel.

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**4,336,717**
**DEVICE TO CLAMP A WHEEL ON THE SHAFT OF A BALANCING MACHINE**

**Eickhart Goebel, Pfungstadt, Fed. Rep. of Germany, assignor to Gebr. Hofmann GmbH & Co. KG, Maschinenfabrik, Darmstadt, Fed. Rep. of Germany**

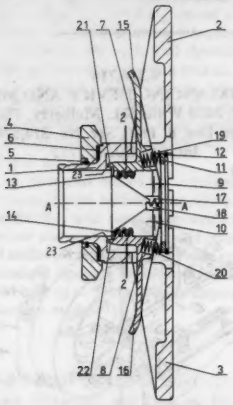
**Filed Aug. 28, 1980, Ser. No. 181,981**
**Claims priority, application Fed. Rep. of Germany, Aug. 31, 1979, 2935216**
**Int. Cl.³ G01M 1/06**
**U.S. Cl. 73—487** **10 Claims**

**1.** Clamping device for clamping a vehicle wheel on a threaded clamping shaft of a test machine comprising:

means for defining a basic body (1) positionable on and translatable and rotatable with respect to a threaded clamping shaft (S) of a balancing machine; and

a pair of swivelling levers (7,8) pivotally mounted on said basic body, each of said levers having an extremity thereof forming a threaded segment (13,14) movable into an out of engagement with the threaded clamping shaft, an extremity forming an actuating lever (15,16) for controlling engagement of said threaded segment with the threaded

clamping shaft, and a portion (17,18) thereof cooperating with a corresponding portion of the other lever in such



manner that movement of one of said levers results in conjoint movement of the other of said levers.

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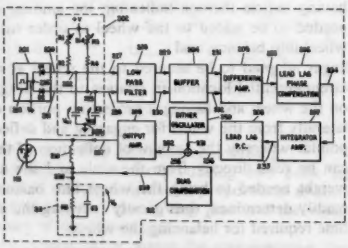
4,336,718

## CONTROL CIRCUIT FOR ACCELEROMETER

John R. Washburn, Grand Rapids, Mich., assignor to Lear Siegler, Inc., Santa Monica, Calif.

Filed Sep. 8, 1980, Ser. No. 184,796
Int. Cl.[3] G01P *15/13*
U.S. Cl. 73—517 B 22 Claims



1. An accelerometer adapted to measure magnitude and direction of an acceleration force externally applied thereto and comprising:

an accelerometer housing assembly;

indicating means pendulously supported within said housing assembly for indicating, via a positional displacement thereof, the occurrence of said acceleration force, wherein said indicating means is pendulously supported at a null position in the absence of said acceleration force;

detection circuit means for detecting said positional displacement of said indicating means and for generating a restoring signal representative of the magnitude and direction of said positional displacement;

restoring means coupled to said detection circuit means and responsive to said restoring signal for restoring said indicating means to said null position;

output circuit means electrically coupled to said restoring means and comprising an output terminal for generating an output signal thereat indicative of the magnitude and direction of said externally applied acceleration force; and characterized in that

said accelerometer further comprises bias compensation circuit means connected to said output terminal and selectively adjustable to apply a correction signal to said output circuit means, wherein said correction signal is of a substantially equal magnitude and opposite in direction to components of said output signal due to static bias factors.

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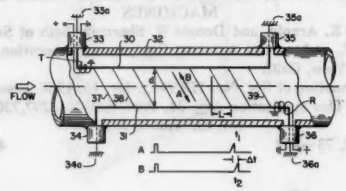
4,336,719

## ULTRASONIC FLOWMETERS USING WAVEGUIDE ANTENNAS

Lawrence C. Lynnworth, Waltham, Mass., assignor to Panametrics, Inc., Waltham, Mass.

Filed Jul. 11, 1980, Ser. No. 168,325
Int. Cl.[3] G01F *1/66*
U.S. Cl. 73—861.27 44 Claims



1. Apparatus for measuring the flow velocity of a fluid comprising:

at least one pair of spaced apart, elongated waveguide antennas for propagating ultrasonic waves, each antenna containing at least one segment immersed in said fluid, and wherein at least one immersed segment in each of said antennas lies in a plane which is substantially parallel to the flow velocity vector of said fluid;

first transducer means for launching an ultrasonic wave at a first time along one of said waveguide antennas for transmission through said fluid;

second transducer means for detecting at a second time said ultrasonic wave received in another of said waveguide antennas; and

processing means operating on said received ultrasonic wave for computing the flow velocity of said fluid.

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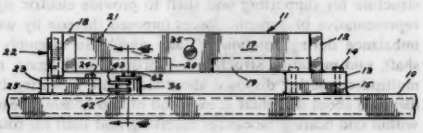
4,336,720

## LOAD SENSING SYSTEM

James A. Prokop, St. Paul, Minn., assignor to Lull Engineering Company, Inc., St. Paul, Minn.

Filed Aug. 22, 1980, Ser. No. 180,376
Int. Cl.[3] G01D *1/00*; B66C *13/50*
U.S. Cl. 73—862.53 8 Claims



1. A load sensor system for a load carrying vehicle having a hydraulically controlled load carrier subject to cantilever loading, said vehicle including a load bearing frame and an axle supporting said frame, said sensor system comprising:

(A) a sub-frame assembly comprising part of the load bearing frame by which said frame is secured to said axle so as to be partially separable therefrom,

(B) a hydraulic system including double acting cylinders for lifting and extending the load carrier, and

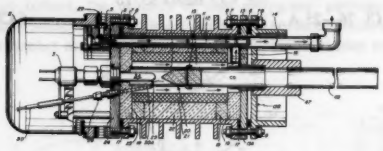
(C) a mechanically actuated relief valve load sensing device connected into said hydraulic system and disposed between said axle and sub-frame assembly.

4,336,721

## GAS ANALYZER

Richard H. Curtis, Gorham, Me., assignor to Hague International, South Portland, Me.

Filed Jun. 3, 1980, Ser. No. 155,940
Int. Cl.³ G01N 1/22
U.S. Cl. 73—863.11 18 Claims



1. Gas sampling apparatus comprising;
a housing,
an inlet tube means for receiving a sample of gas and supported within said housing,
a gas sensing cell,
means disposing the gas sensing cell in the housing in a position to have the gas sample pass thereover,
a heating means,
means supporting the heating means in the housing about at least a section of the inlet tube means and forming a heated gas passage disposed about the inlet tube means,
means providing gas communication from the inlet tube means to the gas passage,
nozzle means,
means supporting the nozzle means in the inlet tube means in a position to block a portion of the inlet tube and meter the gas flow, and
aspirator means at least in part in the housing for purging the gas sample from the heated passage.

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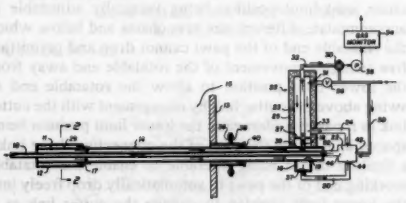
4,336,722

## METHOD AND APPARATUS FOR SAMPLING WASTE GASES

Ernest D. Schweitzer, Saanichton, Canada, assignor to Candel Industries, Limited, Victoria, Canada

Filed Nov. 4, 1980, Ser. No. 203,935
Int. Cl.³ G01N 1/14
U.S. Cl. 73—863.12 18 Claims



1. Apparatus for continuously withdrawing a gas sub-sample from a waste gas chamber enclosing a source of waste gas for introduction of the sub-sample to a gas monitor, comprising:
(a) a sample probe tube having a sample gas probe inlet located within said chamber and a gas passageway extending from the probe inlet to an exit region exterior to said chamber for continuously withdrawing a sample of said waste gas, said probe inlet for filtering out particulate matter present in the waste gas;
(b) a baffle located proximate the sample gas inlet for deflecting particulate matter present in the waste gas;
(c) an aspirator having an aspirating gas inlet for coupling to a source of aspirating gas, an exhaust outlet and a sump line inlet;
(d) a sump line connected to said exit region and extending to the aspirator sump line inlet for conducting gas flowing through the exit region to the aspirator;
(e) a return tube extending from said aspirator exhaust outlet to the interior of said waste gas chamber for conducting excess sample gas and aspirator gas thereto;
(f) a sub-sample tube connected to the exit region at one end and couplable at its other end to a gas monitor; and
(g) an adiabatic cooling chamber having a cooling gas inlet and outlet, said chamber enclosing at least a portion of said sub-sample tube for cooling sub-sample gas therein below the ambient dew point so that resultant condensate from the sub-sample gas falls back into the flow of sample gas and is conducted thereby to the aspirator and then out through said return tube into said waste gas chamber.

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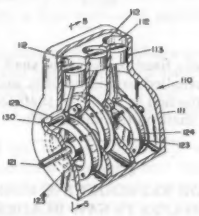
4,336,723

## POWER TRANSMISSION

Jose M. Barcita, 2809 Oakland Ave., Richmond, Va. 23228

Division of Ser. No. 946,732, Sep. 28, 1978, Pat. No. 4,236,416.
This application Sep. 5, 1980, Ser. No. 184,268
Int. Cl.³ F16H 21/22; G05G 1/00
U.S. Cl. 74—44 3 Claims



1. A power transmission for a plurality of in line reciprocating piston and cylinder devices, comprising a power shaft having an axis from which said piston and cylinder devices are radially spaced, a plurality of eccentric discs corresponding in number to said piston and cylinder devices spaced along said power shaft and made fast thereto, each of said eccentric discs being interposed between a different one of said piston and cylinder devices and said power shaft, an eccentric strap bearing on each of said eccentric discs, a pair of cranks journaled on opposite sides of each eccentric strap, each of said cranks having a crankpin connecting said crank to one side of a respective one of said eccentric straps and a crankshaft rotatable about an axis parallel to said power shaft, each of the crank shafts being axially aligned with all of the other crankshafts, and a plurality of pitmans, each pitman connecting a different one of said pistons to the eccentric strap interposed between the respective piston and power shaft, the throw of each pair of cranks being parallel to the throw of the eccentric strap to which the pair is connected, said eccentrics having a throw substantially greater than the throw of said cranks so that a positive mechanical advantage is obtained by said power transmission in the transfer of power from said pistons to said power shaft.

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4,336,724

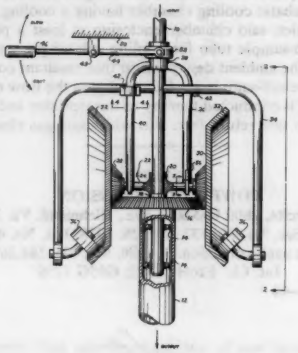
## VARIABLE SPEED TRANSMISSION

Pete Mize, Rte. 3, Comanche, Tex. 76442

Filed May 28, 1980, Ser. No. 154,001
Int. Cl.³ F16H 3/44, 57/10
U.S. Cl. 74—750 R 9 Claims

1. A variable speed transmission comprising in combination
a. an input shaft,
b. an output shaft coaxial with the input shaft,
c. a bevel gear with teeth coaxial with and rigidly fixed to the output shaft,
d. a cross shaft journalled to the input shaft,

e. at least one pinion with teeth journalled on the cross shaft and having its teeth engaged with the gear teeth,
f. a disc rigidly fixed to the pinion,
g. a rim on the disc,
h. a roller engaging the rim of the disc, so arranged and constructed that the gear is between the roller and pinion,



i. a bracket rigidly fixed to the input shaft,
j. said roller journalled to said bracket, and
k. fork means attached to the input shaft for angularly moving the cross shaft on the input shaft.

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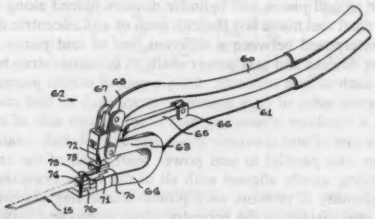
**4,336,725**

## APPARATUS FOR REPRODUCING CODED CONTOUR SHAPES IN SAW BLADES

**Dennis O. Patterson, 11842 Victory Blvd. #11, North Hollywood, Calif. 91606**

**Filed May 2, 1980, Ser. No. 146,070**
**Int. Cl.³ B26F *1/36, 1/40***
**U.S. Cl. 76—25 R** **6 Claims**



1. An apparatus for reproducing a coded portion of a saw blade in a severed or broken saw blade comprising the combination of:
a support block;
a movable plunger operably carried over said support block;
a die set having one die member fixed on said support block and the other die member carried on said plunger;
said die set members aligned with respect to each other so as to lie on a common axis;
said die set members having opposing faces carrying a cutting die shaped in the form of the coded portion intended to be reproduced;
a clamping and squaring means carried on said support block immediately ahead of said die set for receiving and holding the severed or broken saw blade so as to lie between said die set members;
said plunger adapted to receive applied force urging said die set members together to form said saw blade;
said apparatus is of a plier type having a pair of jaws; and
said plunger operating through a selected one of said jaws effecting closure of said die set members together to form said saw blade.

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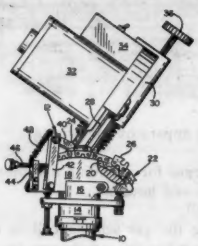
**4,336,726**

## CHAIN STOP FOR SAW CHAIN GRINDER

**Elmer R. Silvey, 1231 Dutton Rd., Eagle Point, Oreg. 97524**

**Filed May 8, 1980, Ser. No. 148,168**
**Int. Cl.³ B23D *63/16***
**U.S. Cl. 76—25 A** **6 Claims**



1. A machine for sharpening the cutter links of a saw chain having both cutter links and connecting drive links comprising a grinding wheel, means for supporting the grinding wheel for rotation in a first plane, a holder for supporting the saw chain in a second plane so that a cutter link located in a sharpening station on the holder will have its cutting edge oriented properly for sharpening by the grinding wheel, and a chain stop mechanism mounted adjacent to the sharpening station for holding the cutter link in proper position in the sharpening station, the chain stop mechanism being characterized by:
a pawl pivotally supported for free rotational movement rearwardly of a rotatable working end, a first surface on the rotatable end adapted to contact an outer surface of the cutter link to resist the tendency of the cutter link to lift away from the holder during sharpening, and a second surface on the rotatable end adapted to contact a rearward surface of the cutter link to resist the tendency of the cutter link to move away from the grinding wheel during sharpening; and
adjustable limiting means cooperable with the pawl for establishing a lower limit position independent of the saw chain, said limit position being vertically adjustable to accommodate different size saw chains and below which the rotatable end of the pawl cannot drop and permitting free swinging movement of the rotatable end away from the lower limit position to allow the rotatable end to swing above the cutter link by engagement with the cutter link as it passes underneath, the lower limit position being spaced apart from the path of the connecting drive links,
the limiting means being operable to enable the rotatable working end of the pawl to automatically drop freely into the lower limit position to engage the cutter link as it reaches the sharpening station with the first surface of the rotatable end in contact with the outer surface of the cutter link and the second surface of the rotatable end in contact with the rearward surface of the cutter link.

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**4,336,727**

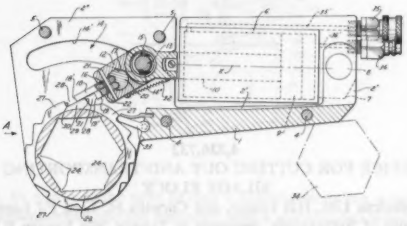
## HYDRAULIC WRENCH FOR LIMITED SPACE APPLICATION

**John K. Junkers, 7 Arrowhead La., Saddle River, N.J. 07458**

**Filed Feb. 28, 1980, Ser. No. 126,859**
**Int. Cl.³ B25B *13/46***
**U.S. Cl. 81—57.39** **17 Claims**

1. A hydraulic wrench comprising support means; fluid operated means including a cylinder having an axis and being mounted on said support means against movement in axial

direction, a piston reciprocatable along said axis in said cylinder and a piston rod fixed to said piston for reciprocation therewith; a socket having an outer cylindrical surface and being mounted on said support means for turning about a second axis substantially normal to and laterally of said cylinder, said socket being formed with a passage of polygonal cross-section therethrough extending along said second axis for engagement with a polygonal head of a threaded connector to be turned, the corners of said polygonal passage being closely adjacent to said outer peripheral surface of said socket; and ratchet means between said fluid operated means and said



socket for turning the latter about said second axis during reciprocation of said piston in said cylinder, said ratchet means comprising pawls means tiltably connected to said piston rod and a ratchet wheel fixed to said outer peripheral surface of said socket, said ratchet wheel having an outer cylindrical rim concentric with said outer surface and having a series of circumferentially spaced solid uninterrupted portions respectively arranged in the regions of said corners of said passage and gear teeth in said rim between said solid portions to be engaged by said pawl means, so that considerable forces may be used for tightening the head of a threaded connector without any danger of destroying said socket or said ratchet wheel.

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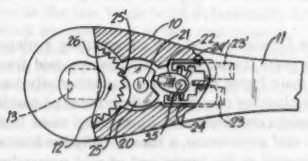
**4,336,728**

## PUSH-BUTTON REVERSIBLE RATCHET AND PAWL SOCKET WRENCH HANDLE

**Raymond L. Deibert, 105 Milford Ave., Greenmount, Wilmington, Del. 19809**

**Filed Oct. 8, 1980, Ser. No. 195,186**
**Int. Cl.³ B25B *13/46***
**U.S. Cl. 81—62** **8 Claims**



1. A cam rod operated reversible ratchet and pawl for use in a reversible socket wrench handle comprising:

a ratchet wheel;

a pivotably mounted pawl having a front end in contact with said ratchet wheel and a back end;

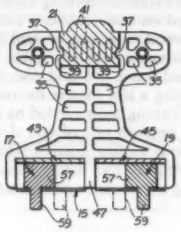
a pivotably mounted actuator comprising at least one driving surface and a resiliently mounted pin in contact with said back end of the pawl, and at least two cam rods slideably mounted in said wrench handle, extending through said handle and engaging the driving surface on the actuator.

**4,336,729**

## COMPOSITE TOOL

**Lawrence C. Eppenbach, 419 Kennedy St., Juneau, Ak. 99801**

**Filed Aug. 4, 1980, Ser. No. 174,883**
**Int. Cl.³ B25B *23/00***
**U.S. Cl. 81—439** **8 Claims**



1. A composite tool comprising:

first and second half sections of plastic material;

means for attaching said half sections to each other to form a tool body, a first portion of said tool body defining a handle;

a channel assembly mounted within a second portion of said tool body and spaced from said handle portion;

first and second pin members mounted within said channel assembly for movement toward and away from each other;

each of said pin members having a workpiece engaging section extending from the tool body and adapted to engage a workpiece and apply torque thereto; and

said channel assembly including a first channel having at least one of said pin members mounted therein, said first channel including at least one shoulder projecting from said channel and received by a corresponding groove in at least one of said half sections to thereby at least assist in mounting said first channel on said tool body.

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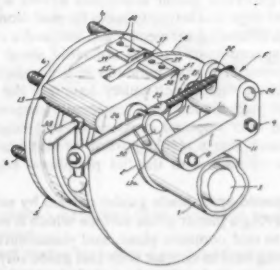
**4,336,730**

## FIXTURE FOR RESURFACING VEHICLE BRAKE DISCS

**William L. Kopecko, P.O. Box 183; Robert L. Fuller, 309 Alban St., and Joseph O. Duchac, Rte. 6, all of Rhinelander, Wis. 54501**

**Filed Jul. 23, 1980, Ser. No. 171,312**
**Int. Cl.³ B23B *5/04***
**U.S. Cl. 82—4 A** **5 Claims**



1. A resurfacing tool fixture for simultaneous resurfacing opposite sides of a brake disc of a wheel of a vehicle without removing said disc from said vehicle but when said wheel has been removed; said fixture comprising a swingable tool holder frame, means for pivotally mounting said frame on said vehicle, adjustable means for swinging said swingable frame rela-

tive to said disc, a pair of cutting tools carried by said swingable tool holder frame, one on each side of said disc for simultaneous cutting contact with opposite sides of said disc as said swingable frame is swung by said adjustable means.

2. A resurfacing tool fixture for simultaneous resurfacing opposite sides of a brake disc of a wheel of a vehicle without removing said disc from said vehicle but when said wheel has been removed; said fixture comprising a fixed frame rigidly and removably mounted on said vehicle, a swingable tool holder frame having a pivotal mounting on said fixed frame, adjustable means for swinging said swingable tool holder frame relative to said fixed frame and said disc, said swingable tool holder frame defining a slot therein for receiving said disc in said slot, a pair of cutting tools carried by said swingable tool holder frame, one on each side of said slot and adjacent said disc for simultaneous cutting contact with opposite sides of said disc as said swingable tool holder frame is swung about its pivotable mounting by actuation of said adjustable means.

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**4,336,731**

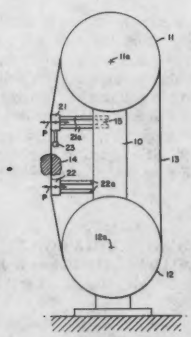
## BAND SAWING MACHINE HAVING MEANS TO APPLY CORRECTIVE TWIST TO THE BLADE

**Urban Eklund, Soderhamn, Sweden, assignor to Kockums Industri AB, Malmo, Sweden**

**Continuation-in-part of Ser. No. 873,263, Jan. 30, 1978, which is a continuation-in-part of Ser. No. 709,852, Jul. 29, 1976, Pat. No. 4,085,636. This application Mar. 20, 1980, Ser. No. 132,287**

**Int. Cl.³ B23D *55/08***

**U.S. Cl. 83—74** **25 Claims**



1. A band saw machine comprising:

a machine stand;

an endless generally planar saw blade having a front edge and a rear edge and a row of teeth formed along the front edge and extending between a top line and a root line;

a pair of spaced-apart pulleys rotatable about respective parallel rotational axes mounted in a common plane on said machine stand, each pulley having a flat peripheral edge and said blade being tensionally disposed on and entrained over opposed portions of said edges on both pulleys such that a planar portion of said blade is maintained in contact with the flat peripheral edges of said pulleys;

a pair of spaced-apart blade guides carried by said machine stand, having a planar guide surface which is substantially parallel to said common plane, said planar surface of said blade being held in contact with said guide surfaces by the inherent tension of said blade such that said blade is free of substantial twist, the portion of the blade between the two blade guides defining a working zone of the blade which is substantially parallel to said common plane, the front face on at least one blade guide being displaceable, during sawing, relative to the machine stand;

a position sensor for continuously sensing, during sawing, lateral displacement of the said working zone of the blade from a position of correct cut and for generating a corresponding electrical signal;

a processing means for receiving the generated signal and processing it into an electrical operative signal; and

driving means receiving the operative signal for applying a corrective force to said planar guide surface on at least one blade guide which is linearly proportional to said operative signal to cause said blade to move laterally in linear proportion to and in the opposite sense of the sensed lateral displacement of the blade irrespective of the direction of the sensed lateral displacement.

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**4,336,732**

## DEVICE FOR CUTTING OUT AND TRANSPORTING A SILAGE BLOCK

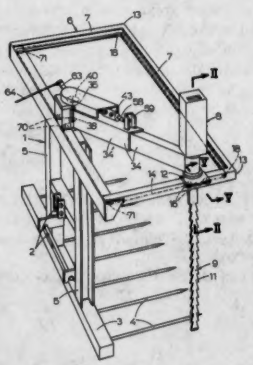
**Fredericus Liet, HD Losser, and Cornelis H. Liet, PJ Losser, both of Netherlands, assignors to Trioliet Silo Europe B.V., AE Losser, Netherlands**

**Filed Jun. 6, 1980, Ser. No. 157,170**

**Claims priority, application Netherlands, Jun. 8, 1979, 7904534**

**Int. Cl.³ A01F *25/20*; B65G *65/40***

**U.S. Cl. 83—109** **26 Claims**

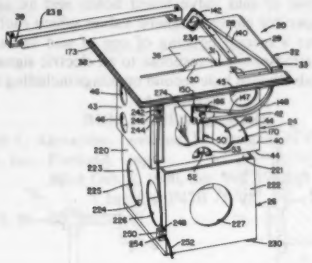


1. A device for cutting out and transporting a silage block, comprising a main frame, means to connect said frame to a tractor, said main frame comprising a substantially horizontal cross-beam, a plurality of substantially horizontal parallel tines attached to said cross-beam, an upstanding main frame part connected to said cross-beam, a substantially horizontal frame member supported at the upper end of said upstanding main frame part, a substantially U-shaped guide member integral with said horizontal frame member, a drive housing operatively engaging said guide member for movement therealong, a sawing means mounted and guided in said drive housing for upward and downward movement, drive means on said horizontal frame member for moving said drive housing along said U-shaped guide member, both corners of said U-shaped guide member remote from the upstanding main frame part being substantially right angle corners, and means for rotating said sawing means at said corners through at least approximately 90° about an axis of rotation which is substantially stationary during this rotating motion and which substantially coincides with the longitudinal center line of the sawing means.

## 4,336,733
## ROCKING ARM SAW

Albert A. Macksoud, R.R. #1, Leamington, Ontario, Canada N8H 3V4

Filed Jun. 6, 1980, Ser. No. 157,073
Int. Cl.³ B27B 5/06, 5/18; B23D 45/04
U.S. Cl. 83—477.2 4 Claims



1. In a saw of the type having a housing including a work piecesupporting surface provided with a slot through which a circular disk-type saw blade may selectively project from beneath said surface, a rocker arm pivotally mounted within said housing for swinging movement about an axis parallel with the rotational axis of said saw blade, motor means secured to said rocker arm for swinging movement therewith and for selectively causing said saw blade to rotate, a manually operable handle secured to said rocker arm and normally projecting above said surface for access by the saw operator, said rocker arm being movable by said handle between a first position wherein said saw blade is completely withdrawn below said surface and a second position wherein said saw blade projects upwardly through said slot for cutting of work pieces located on said surface, said handle permitting an operator to pull said saw blade through a fixed work piece for cutting thereof as said rocker arm blade is pulled from said first position toward said second position, locking means for selectively locking said rocker arm and saw blade in a fixed position relative to said surface to permit said saw to be utilized as a table saw with a portion of said blade projecting upwardly through said slot; the improved arrangement for mounting said motor means and for controlling the movement of said rocker arm comprising:

said motor means being mounted on the end of said rocker arm remote from the pivot axis thereof for swinging movement therewith and being located immediately beneath the underside of said surface when said saw blade projects through said slot, and the drive train from the motor to the saw blade being substantially fully enclosed to block accumulation of saw dust thereon;

resilient means urging said rocker arm from said second position toward said first position to cause said saw blade to be safely withdrawn beneath said surface unless it has been locked in an exposed position or unless a manually applied force is maintained to overcome the biasing force from said resilient means.

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## 4,336,734
## DIGITAL HIGH SPEED GUITAR SYNTHESIZER

Robert D. Polson, 1140 S. 500 East, Apt. #2, Salt Lake City, Utah 84105

Filed Jun. 9, 1980, Ser. No. 157,423
Int. Cl.³ G10H 1/00
U.S. Cl. 84—1.01 16 Claims

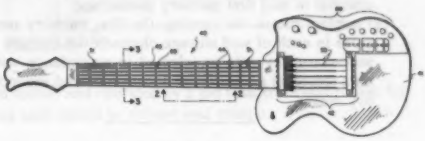
1. An electronic instrument configurated and arranged for operation by approximately the same physical motions involved in playing an electronic guitar to produce electronically generated music, comprising:

an arm with a grid of addresses corresponding to the intersection regions of a plurality of ranks of fret locations and a plurality of files of string locations, each said address being associated with touch-sensitive electronic means in circuit with pitch-control means;

a strum structure including at least one strum switch in circuit with tone-generating means; and

control circuit means interconnecting said pitch control means, said tone-generating means and a power supply,

wherein said touch-sensitive, electronic means associated with an address is a normally-open switching circuit including:



a conductive element carried by said arm and arranged for contact with the palm of the hand of an individual holding the arm to press the fret location of that address in the manner of a guitar player, said conductive element constituting a first contact and

said fret location including a second contact at that address; and

said normally-open switching circuit is adapted to close when said first and second contacts are connected through the hand of an individual holding said arm and touching said fret location at that address.

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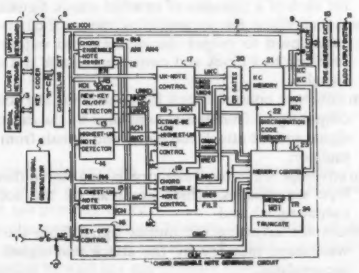
## 4,336,735
## ELECTRONIC MUSICAL INSTRUMENT GENERATING SUPPLEMENTARY NOTES AUTOMATICALLY ESTABLISHED FROM PLAYED NOTES

Takehisa Amano; Seiya Hamada; Sigeki Isii, and Toshio Takeda, all of Hamamatsu, Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Dec. 16, 1980, Ser. No. 216,961
Claims priority, application Japan, Dec. 17, 1979, 54/163884
Int. Cl.³ G10H 1/22
U.S. Cl. 84—1.17 18 Claims



1. A polyphonic, keyboard-type electronic musical instrument comprising:

(a) keyboard means including keys for playing notes;

(b) means for generating in response to actuation of said keys primary key data each representative of a first note which is a note played by each of said keys;

(c) means for generating in response to actuation of said keys secondary key data each representative of a second note which is a note other than said first note and having a predetermined relationship to said first note;

(d) tone generator means having a plurality of sounding

channels for simultaneous production of tones in response to said primary and the secondary key data;

(e) first memory means having a plurality of storage channels for storing said primary and the secondary key data and delivering to respective ones of said sounding channels of said tone generator means;

(f) second memory means having a plurality of storage locations, respectively corresponding to the storage channels of said first memory means, each for storing a data representing the discrimination between said primary and the secondary key data stored in each corresponding storage channel of said first memory means; and

(g) control means for causing the first memory means to store in each of said storage channels the primary or the secondary key data as selected in accordance with said data stored in each storage location of said second memory means.

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## 4,336,736
## ELECTRONIC MUSICAL INSTRUMENT

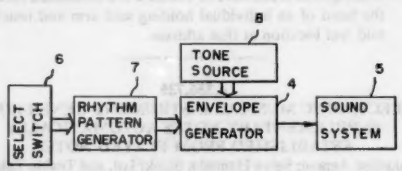
**Toshio Mishima, Kitamoto, Japan, assignor to Kabushiki Kaisha Kawai Gakki Seisakusho, Japan**

**Filed Jan. 28, 1980, Ser. No. 116,000**

**Claims priority, application Japan, Jan. 31, 1979, 54-10544; Jan. 31, 1979, 54-10545; Feb. 3, 1979, 54-11529; Feb. 5, 1979, 54-12025; Feb. 5, 1979, 54-12026; Mar. 17, 1979, 54-31410; Aug. 4, 1979, 54-99637; Nov. 8, 1979, 54-144816**

**Int. Cl.³ G10H *1/02***

**U.S. Cl. 84—1.26** **7 Claims**




1. An electronic musical instrument comprising:

a rhythm pattern generator producing an external attack signal;

an attack/decay coefficient memory having stored therein coefficients relating to attack and decay times respectively for each of a plurality of external attack signals;

an accumulator for accumulating the coefficients at a constant speed to output the accumulated output signal in response to a clock and outputting attack and decay end signals;

an envelope control circuit for controlling the accumulated output signal from the accumulator by the external attack signal and the attack and decay end signals from the accumulator;

an envelope waveshape memory having stored therein envelope waveshapes, which are read by the accumulated output signal; and

means for inverting the output signal from the envelope waveshape memory by the attack end signal from the accumulator.

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## 4,336,737
## RELAY VALVE ASSEMBLY FOR PLAYER PIANOS

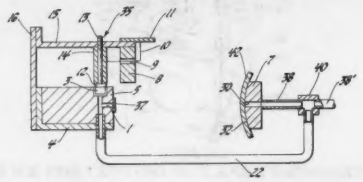
**Harry A. Pomber, Sault Ste. Marie, Canada, assignor to Sounds Alive Systems, Inc., Houghton Lake, Mich.**

**Filed Apr. 21, 1980, Ser. No. 142,088**

**Int. Cl.³ G10F *5/04***

**U.S. Cl. 84—151** **3 Claims**

1. Apparatus for controlling operation of a player piano of the type that generally includes a vacuum source, a tracker bar having an array of holes positioned so as to extend through the tracker bar and be selectively exposed to the atmosphere as a perforated music sheet is passed across the tracker bar, and an array of pneumatic tubes which each connect the vacuum source to one of the tracker bar holes opposite the music sheet, comprising, in combination, an array of "T" connections each of which is inserted in one of said pneumatic tubes; a valve board; an array of holes which each have first and second openings in said valve board; a second array of pneumatic tubes which each connect one of said "T" connections to a first opening of one of said valve board holes; and an array of selectively operable electromagnetic valves which each selectively connect a second opening of one of said valve board holes to the atmosphere in response to an electric signal, each one of said valve board hole second openings including a valve



seat and each one of said electromagnetic valves including a cylindrical free floating magnetic valve having a substantial height positioned so as to be held by gravity on one of said valve seats to prevent one of said valve board hole second openings connecting to the atmosphere and an electromagnet positioned above said cylindrical free floating magnetic valve so as to lift said free floating magnetic valve off said valve seat when said electromagnet is energized whereby said vacuum source may be selectively connected to the atmosphere (A) through said tracker bar holes in response to said music sheet or (B) through said valve board in response to said electric signals.

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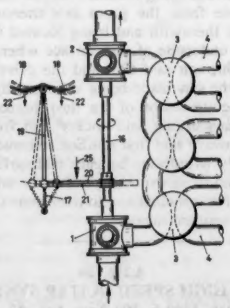
## 4,336,738
## MUSICAL INSTRUMENT

**Anton Alexander, Mainz, Fed. Rep. of Germany, assignor to Fa. Gebr. Alexander Rheinische Musikinstrumentenfabrik GmbH, Mainz, Fed. Rep. of Germany**

**Filed Jun. 10, 1980, Ser. No. 158,224**

**Int. Cl.³ G10D *9/04***

**U.S. Cl. 84—390** **3 Claims**



1. A metallic wind instrument with multiple tuning slide valve blocks and a pair of directional air control valves for selecting one tuning slide valve block, there being only one pair of directional air control valves which directs the air current selectively to one tuning slide valve block, each of said directional air control valves consisting of a cylindrical housing having a plurality of apertures for the passage of air therethrough in the cylinder casing thereof and one aperture for the passage of air therethrough in one axial end wall of the cylin-

der, and a valve body having an internal passage that is in the form of a pipe elbow and is rotatable in the housing to register with one of the plurality of apertures at one time, wherein the two valve bodies of the pair of directional air control valves are disposed on a common rotating axle which is maintained in one control position by spring tension and is selectively brought into the other control positions by means of a lever mechanism.

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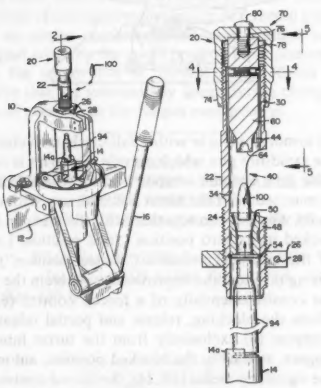
## 4,336,739
## BULLET SEATING DIE

**Kenneth L. Alexander, Lewiston, Id., assignor to Omark Industries, Inc., Portland, Oreg.**

**Filed Oct. 2, 1980, Ser. No. 193,100**
**Int. Cl.³ F42B *11/02***
**U.S. Cl. 86—43** **15 Claims**



**1.** A bullet seating die comprising

a body member having an elongate bore therein,

a bullet seating member mounted in said body member for shifting longitudinally of said bore between selected adjusted positions, and

yieldable stop means operable to produce resistance to adjustment of said seating member at pre-selected intervals of adjustment, which resistance may be manually sensed and overcome to permit readjustment, said stop means comprising a plurality of depressions defined in one of said members and an element on the other of said members yieldably biased into a position to engage said depressions as said seating member is shifted to selected adjusted positions.

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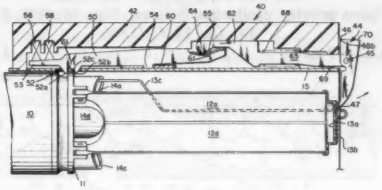
## 4,336,740
## AUTOMATIC BLAST ACTUATED POSITIVE RELEASE MISSILE DETENT

**Michael L. Leigh, Agoura, and Richard D. Stubbs, Woodland Hills, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.**

**Filed Dec. 29, 1978, Ser. No. 974,479**
**Int. Cl.³ F41F *3/04***
**U.S. Cl. 89—1.806** **16 Claims**

**12.** In a missile launcher having a support slidably supporting a rocket propelled missile, a movable restraining member releasably engaging said missile and restraining said missile against sliding movement along said support, and an arrangement for igniting the propellant of said rocket, the improvement comprising a pivoted rocker disposed as said movable restraining member, and a spring-loaded toggle linkage engaging said rocker and operated by a gas blast from said rocket for pivoting said rocker to release said missile.



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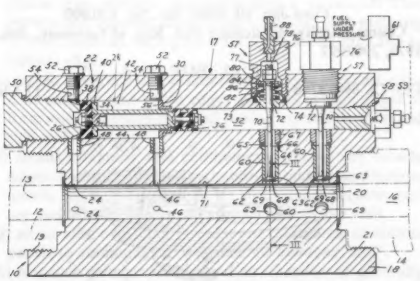
## 4,336,741
## LIQUID PROPELLANT VELOCITY ASSISTANCE SYSTEM FOR GUNS

**William R. Baines, Lake Elsinore, Calif., assignor to Ford Motor Company, Dearborn, Mich.**

**Filed Jan. 17, 1980, Ser. No. 112,779**
**Int. Cl.³ F41F *1/04***
**U.S. Cl. 89—7** **24 Claims**



**23.** A projectile velocity assistance mechanism for a gun having an initial explosive means constructed to provide an initial hot gas pressure charge;

said mechanism including a bore having a firing chamber end and a muzzle end and through which a projectile is propelled by said hot gas pressure charge;

said mechanism also including a liquid propellant supply and metering means constructed to meter liquid propellant from said supply into said bore at a location intermediate said ends of said bore;

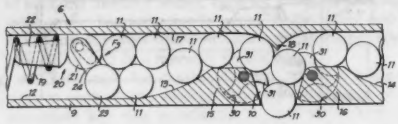
gas pressure responsive means coupled with said metering means and constructed to cause said metering means to meter propellant into said bore at a point in time after said initial explosive means has provided said hot gas pressure charge and a projectile propelled by said charge is between said location and said muzzle end of said bore whereby said propellant is ignited in said bore and increases the gas pressure behind said projectile and thus the velocity of said projectile.

## 4,336,742

## LOADER FOR MACHINE-PISTOL AND SIMILAR

Maurice V. Bourlet, Liege, Belgium, assignor to Fabrique Nationale Herstal, Herstal, Belgium

Filed Oct. 30, 1979, Ser. No. 89,318
Claims priority, application Belgium, Nov. 16, 1978, 57416
Int. Cl.³ F41C *25/04*
U.S. Cl. 89—34 1 Claim



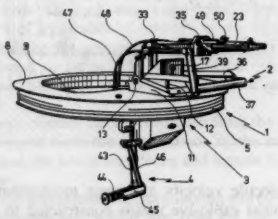
1. Loader for a weapon, including a prismatic tube closed at both ends and having in the central portion of one of its longitudinal walls, a loading-feeding port, and two symmetrical ammunition conveying devices mounted within said tube and each comprising a spring one end of which bears on an adjacent end wall of said closed tube and the other end of which is connected to a plurality of interconnected cylindrical bodies in the tube to permit the complete emptying of the loader, said plurality of cylindrical bodies comprising a first cylindrical body having an oblong slot into which a radial finger of a second cylindrical body adjacent thereto is engaged in order to permit an angular movement and displacement of said second cylindrical body with respect to said first cylindrical body to a position spaced therefrom.

## 4,336,743

## GUN MOUNT FOR LIGHT AUTOMATIC WEAPONS

Kurt Horn, Oberndorf; Walter Müller, Rötenberg, and Adolf Schneider, Altoberndorf, all of Fed. Rep. of Germany, assignors to Heckler & Koch GmbH, Oberndorf, Fed. Rep. of Germany

Filed Jan. 10, 1980, Ser. No. 110,909
Claims priority, application Fed. Rep. of Germany, Jan. 26, 1979, 2902992
Int. Cl.³ F41F *21/14*
U.S. Cl. 89—37 B 17 Claims



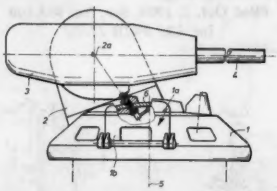
1. A gun mount for light automatic weapons, comprising an upper mount having cradle means for the detachable attachment of the weapon thereto, and having a lower mount having a circular track and being adapted to be attached to a vehicle in such a manner that the upper mount can be rotated about the vertical axis of the circular track together with the weapon, said cradle being pivotable about a horizontal weapon traverse axis aiming means comprising a rigid periscope having fixed reflecting mirrors, whose eyepiece is located below the circular track and whose sight radius is coupled with the traverse motion of the weapon about the weapon traverse axis said aiming means being pivotable about a sight axis which is parallel to the horizontal weapon traverse axis and attached to a blinder having surface areas which are rotationally symmetrical to the sight axis, a connecting rod having one end pivotable about a first traverse axle parallel to the sight axis and rigidly connected to the blinder and the other end articulated about a second traverse axle on said cradle said sight axis, said weapon traverse axis, said first traverse axle and said second traverse axle forming the corners of a parallelogram.

## 4,336,744

## ARMORED VEHICLE

Gert Kausträter, Augsburg, Fed. Rep. of Germany, assignor to Industrie-Werke Karlsruhe Augsburg Aktiengesellschaft, Fed. Rep. of Germany

Filed Nov. 27, 1979, Ser. No. 97,647
Claims priority, application Fed. Rep. of Germany, Nov. 29, 1978, 2851604
Int. Cl.³ F41H *7/02*
U.S. Cl. 89—40 K 12 Claims



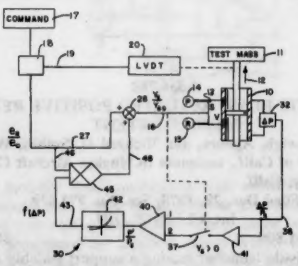
1. In an armored vehicle with a full-circle swivelable turret and with a rapid-fire gun which outside the turret is elevationally aimable on a specific weapon carrier which is constructionally connected with the turret and interacts with mechanical means by which it can together with the weapon be selectively blocked in its zero position ("tied position") or, upon release of the mechanical means ("untied position"), moved into any firing position, the improvement wherein the mechanical means consist essentially of a forced control (**6**, *7a*, **11**) which effects the blocking, release and partial release of the weapon support (**3**) exclusively from the turret interior and which triggers, at least in the blocked position, automatically at least one signalling means (**13**, **14**), the forced control including a gate type guide (*7a*) having cam surfaces defining lock-in positions (*7b*, *7c*, *7d*) which permit movement of an operator (**6**) from a blocking position (*7b*) through a partially released position (*7c*) to a position of release (*7d*) and vice versa.

## 4,336,745

## SERVOVALVE FLOW LINEARIZATION CIRCUIT

Richard A. Lund, Chaska, Minn., assignor to MTS Systems Corporation, Eden Prairie, Minn.

Continuation of Ser. No. 929,573, Jul. 31, 1978, abandoned. This application Feb. 22, 1980, Ser. No. 123,720
Int. Cl.³ F15B *21/02, 13/16*
U.S. Cl. 91—35 5 Claims




1. A flow control linearizing circuit for obtaining desired flow rates from a servovalve having a spool and having a pair of output passageways coupled to an actuator having means

for reciprocating a load in a loading cycle which results in different differential pressures at the output passageways of the servovalve during the loading cycle, the flow in said output passageways being a function of a spool position input command signal provided to said servovalve and which changes in sign between negative and positive during the loading cycle, and including means providing an error control signal representing a combined programmed command signal and feedback signal, wherein the improvement comprises means to compensate the error control signal including means to provide a signal representative of the differential pressure at the output passageways of the servovalve during operation, means to process said signal from said means to provide and to deliver a processed signal which is a desired function of the signal from the means to provide and is correlated to the sign of the spool position input command signal, function generator means coupled to said means to process to provide a predetermined output compensation signal as a function of said processed signal, and means to combine said compensation signal with said error control signal to adjust the error control signal as a function of the signal representing differential pressure and provide an output comprising the spool position input command signal whereby the spool position input command signal controls the servovalve to provide output flows from the servovalve that are substantially linear during changes of said differential pressure at the output passageways.

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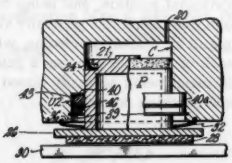
**4,336,746**

## SELF RETRACTING PISTON APPLICABLE FOR DISK BRAKE ASSEMBLIES

**Franklin J. Morith, 2112 Lee Ave., South El Monte, Calif. 91733**

**Filed Nov. 21, 1980, Ser. No. 209,049**
**Int. Cl.³ F01B *31/00*; F16J *15/18***
**U.S. Cl. 92—130 B** **6 Claims**



**1.** In combination, a first member comprising a piston, a second member comprising a wall circumferentially surrounding said piston and defining a piston chamber for receiving said piston, and means for applying and relieving operating pressure to the piston for its axial extension and retraction within the piston chamber:

a retraction control unit surrounding the piston and carried by one of said members disposed axially slidable relative to the other said member, said unit comprising a positioning bracket holding a pair of coaxial rings within a peripheral recess formed in one of said members along said interface, a first one of said rings being an axially compressible, resilient ring, and a second one being a radially tensioned anchorage ring formed with a pair of generally parallel, circumferential faces, radially spaced apart and surrounding said piston, one of said parallel faces being disposed surrounding said piston so as to define an axial slideway for reciprocable movement of the piston, and the other parallel face being radially tensioned so as to frictionally engage one of said members for anchorage of the control unit thereto,

stop means disposed along said slideway adjacent said control unit and positioned to limit the axial compression of said first ring when effected by extension of the piston to an operating position, whereby upon release of operating pressure, resilient expansion of said first ring by the amount of its compression causes retraction of the piston by a corresponding amount.

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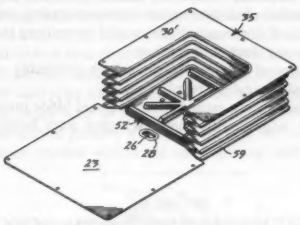
**4,336,747**

## PRODUCT AND METHOD OF MAKING BELLOWS

**Ray S. Totty; Gary N. Love, and Jeffrey L. Zolot, all of Columbia, Tenn., assignors to Packaging Associates, Inc., Columbia, Tenn.**

**Filed Apr. 28, 1980, Ser. No. 144,290**
**Int. Cl.³ F01B *19/00***
**U.S. Cl. 92—43** **9 Claims**



**1.** A bellows comprising:

(a) a top panel of plastic sheet material having front, side and rear edges,

(b) a bottom panel of plastic sheet material having front, side and rear edges, the rear edge of said bottom panel integrally joining the rear edge of said top panel to form a hinged connection,

(c) a generally U-shaped, accordion-like wall comprising a plurality of vertically stacked, substantially U-shaped gussets, including a top gusset and a bottom gusset,

(d) each of said gussets being formed of a strip of flexible plastic sheet material and comprising a continuous front portion and opposed side portions coplanar with said strip of sheet material, each gusset having an inside edge and an outside edge,

(e) means integrally and continuously joining alternate adjacent pairs of said inside edges and said outside edges to form said accordion-like wall having expansible front and side wall portions,

(f) means integrally and continuously joining the outside edges of the top and bottom gussets to said top and bottom panels, respectively, to form an air chamber between said top and bottom panels and said accordion-like wall,

(g) an air inlet extending through one of said top or bottom panels to communicate with said air chamber, and

(h) a spacer member within said air chamber of generally uniform height for engaging and separating said top and bottom panels when said bellows is in its collapsed position.

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**4,336,748**

## FLUID EXCHANGER

**Stanley I. Martin, Ailsa Craig, and Edward J. Martin, Ballinafad, both of Canada, assignors to Axis Products Limited, Ballinafad, Canada**

**Continuation-in-part of Ser. No. 74,241, Sep. 30, 1979, abandoned. This application Dec. 5, 1980, Ser. No. 213,465**
**Int. Cl.³ F24F *13/00***
**U.S. Cl. 98—33 A** **9 Claims**

**7.** A vent means for buildings and the like said means comprising:

ducting means defining separate first and second ducts side by side and having spaced apart parallel axes and having inside and outside ends;

a fan mounting frame means attached on the inside end of said ducting means, and being releasably movable relative thereto;

inlet fan means mounted on said frame means in communication with said first duct for introducing air into said building;

outlet fan means mounted on said frame means in communication with said second duct for drawing air from the interior of said building through said second duct;

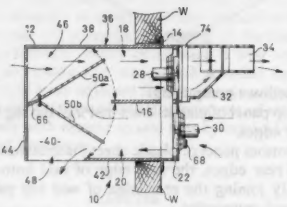
transfer chamber means communicating with the outer end of said ducting means;

air intake means communicating with one portion of said transfer chamber means for admitting fresh atmospheric air;

air outlet means communicating with another portion of said transfer chamber means for discharge of air therefrom, said transfer chamber means communicating with both said ducts of said housing means and permitting transfer of air from one duct to the other;

first and second damper blade means moveably mounted within said transfer chamber means;

swingable mounting means mounting said blade means along adjacent edges, with their swinging axes being spaced



apart and parallel to one another and located between said intake and outlet means in said chamber means, and with their opposite edges being free and directed towards said ducting means, said damper blade means, when swung together lying parallel side by side in closely overlying relation and substantially dividing said transfer chamber means into two parallel duct extensions constituting endwise extensions of said first and second ducts, having central axes that are parallel and spaced apart, whereby transfer of air from one said duct to the other is substantially eliminated and when swung apart, said first blade means moves into the path of said first duct and said second blade means moves into the path of said second duct thereby causing transfer of at least some air from said second duct back into said first duct;

linkage means interconnecting said damper blade means whereby the same move in unison in opposite directions, and,

power operated means connected with said damper blade means for moving the same.

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**4,336,749**

## FAN HOUSING UNIT AND MOUNTING DEVICE THEREFOR

**David A. Barnhart, Madiera; John E. Kroger, Centerville, and David A. Walters, Middletown, all of Ohio, assignors to The Celotex Corporation, Tampa, Fla.**

**Filed Apr. 18, 1979, Ser. No. 31,268**
**Int. Cl.³ F24F *7/00***
**U.S. Cl. 98—43 R** **16 Claims**

1. A fan housing assembly for attachment to a supporting structure of an enclosure to be exhausted comprising:

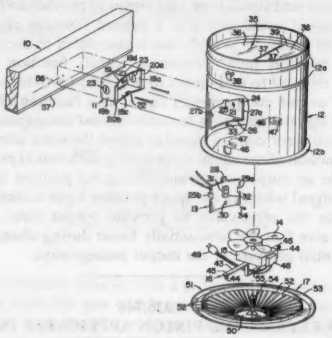
(a) a fan housing comprising a generally cylindrical hollow casing which includes openings at its two ends and means securing said casing to said supporting structure, said casing being vertically positioned on said supporting structure, with the opening at its lower end serving as an air intake opening and the opening at its upper end serving as an air discharge opening,

(b) a blower means for drawing air from said enclosure and blowing the same through said casing to the outside thereof,

(c) an air permeable, decorative grill covering said air intake opening of said casing,

(d) support means for said blower means and said decorative grill, and

(e) a damper member comprising two semicircular plates having their straight edges closely adjacent one another and disposed to either side of a diametrical plane through said casing, each of said plates being rotatably mounted in the top portion of said casing by means of two half-cylin-



drical tabs projecting from the two opposite ends of its straight edge through cooperating apertures in said casing wall, said cooperating apertures being not fully circular holes, said plates being supported in a generally horizontal position blocking said air discharge opening of said casing with the flat diametrical surface of each of said tabs in a generally horizontal position, and being rotatable by air blown through said casing to a generally vertical position not blocking said air discharge opening, wherein said flat surface of each of said tabs assumes a generally vertical position, said plates being normally biased to said generally horizontal blocking position.

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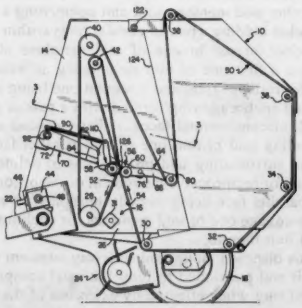
**4,336,750**

## STRAY CROP BUILDUP EXPELLER FOR ROTARY BALERS

**Bruce L. White, North Newton, and Bobby D. McWhirt, Hesston, both of Kans., assignors to Hesston Corporation, Hesston, Kans.**

**Filed Aug. 18, 1980, Ser. No. 179,048**
**Int. Cl.³ B30B *5/06;* A01D *39/00***
**U.S. Cl. 100—88** **4 Claims**



1. In a rotary crop baler:

a pair of spaced apart sidewalls defining a baling chamber therebetween;

a pair of spaced apart arms shiftable generally vertically within said chamber adjacent opposite ones of said sidewalls;

a pair of shafts spanning said arms for shiftable movement therewith and normally bearing against and riding upon the upper periphery of a bale during its formation,

said shafts being transversely spaced apart a sufficient distance to define a gap therebetween;

a flexible, driven web disposed within said chamber for rolling crop material into a cylindrical bale,

said web including a pair of stretches in engagement with opposite ones of said shafts and normally driven in mutually opposite, generally vertical directions through said gap,

one of said shafts and web stretches normally operating in a direction to move the one stretch generally downwardly away from said gap and toward a bale forming in the chamber,

the other of said shafts and web stretches normally operating in a direction to move the other web stretch generally upwardly away from the forming bale and toward said gap; and

means carried only by said one shaft for engaging and expelling stray crop material from the vicinity of said shafts during bale formation,

said engaging and expelling means including a pair of devices adjacent opposite ends of said one shaft, each located between the corresponding arm and the proximal edge of the web stretch associated with said one shaft.

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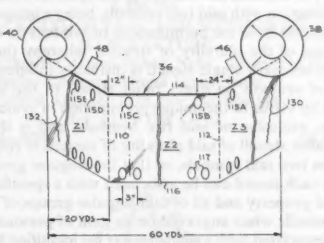
## 4,336,751
## APPARATUS FOR PRODUCING A MULTIPLE COLOR HARD COPY IMAGE

**Raymond F. Melissa; Lorne H. Grummett, both of Costa Mesa, and Joseph J. Fischer, Santa Ana, all of Calif., assignors to Trilog, Inc., Irvine, Calif.**

**Division of Ser. No. 31,076, Apr. 18, 1979, Pat. No. 4,289,069. This application Mar. 6, 1981, Ser. No. 241,448**

**Int. Cl.³ B41J 7/70**

**U.S. Cl. 101—93.04** **18 Claims**




1. A printer/plotter apparatus for use in combination with a source of data signals identifying a first color and a first pattern to be printed in said first color and a second color and a second pattern to be printed in said second color, said apparatus comprising:

a plurality of substantially identical individually actuatable dot hammers mounted for impacting along a line defining a print station;

paper control means for moving an elongated paper web selectively in first and second opposite directions along a path extending substantially perpendicular to said print station line;

ribbon control means including an elongated ribbon comprised of at least first and second zones of different first and second colors, each zone extending along a different portion of the length of said ribbon, and means for moving said ribbon along a path extending between said print station line and said paper path, said ribbon control means including means responsive to said first color identified by said data signals for moving said ribbon to position said first zone of said ribbon adjacent said print station line and responsive to said second color identified by said data signals for moving said ribbon to position said second zone of said ribbon adjacent said print station line; and

hammer driver means responsive to said data signals for selectively actuating said dot hammers to cause the actuated hammers to impact said ribbon and paper to print substantially identically shaped dots on said paper along said print station line;

said paper control means including means for incrementally moving said paper web in said first direction past said print station to sequentially print said first pattern when said ribbon first zone is adjacent said print station line and said second pattern when said ribbon second zone is adjacent said print station line and including means for moving said paper web in said second direction prior to printing said second pattern whereby said first and second patterns can be printed within the same area of said paper web.

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## 4,336,752
## PRINTING APPARATUS OF CHARACTER WHEEL SELECTION, STOP AND SIMULTANEOUSLY PRINTING TYPE

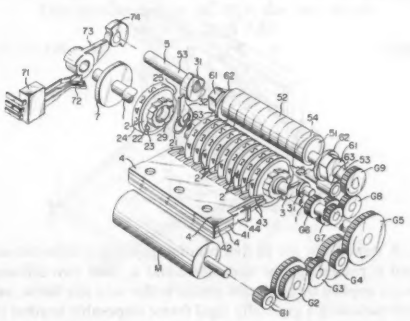
**Osamu Asakura, Tokyo, and Mineo Nozaki, Kawasaki, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan**

**Filed Nov. 16, 1979, Ser. No. 94,789**

**Claims priority, application Japan, Nov. 28, 1978, 53/146786; Nov. 28, 1978, 53/146787; Nov. 28, 1978, 53/146788; Nov. 28, 1978, 53/146789; Nov. 28, 1978, 53/146790; Nov. 28, 1978, 53/146791; Mar. 23, 1979, 54/34509**

**Int. Cl.³ B41J 1/44**

**U.S. Cl. 101—99** **5 Claims**




1. A printing apparatus of the character wheel selection, stop and simultaneously printing type comprising:

a plurality of character wheels;

a shaft rotatably bearing said character wheels;

a plurality of friction springs engaged with said character wheels each having a normally smaller inner diameter than the diameter of said shaft to frictionally engage the circular surface thereof and thereby transmit a rotational force from said shaft to said character wheels;

a ferro-magnetic member provided on a side of each of said character wheels;

a comb-tooth-like magnetic plate having a permanent magnet and being magnetically engagable with said ferro-magnetic members to thereby apply a restraining force to said character wheels;

a plurality of coils each associated with a character wheel for disengaging said magnetic plate from said ferro-magnetic members at selected times, thereby causing associ-

ated character wheels to rotate with said shaft under the rotational forces transmitted by said springs;

stop means for simultaneously causing each of said character wheels to be stationary at a prescribed printing position;

an eccentrically mounted printing platen for effecting printing when said plural character wheels are caused to be stationary by said stop means;

gears for rotating said shaft and said printing platen; and

a motor engaged with said gears;

wherein, during a first rotation of said shaft, said coils are selectively energized to cause associated character wheels to rotate therewith, during a second rotation of said shaft, said stop means causes said character wheels to be stationary at prescribed printing positions and said platen effects printing, and during a third rotation of said shaft, said stop means releases said character wheels causing them to rotate to prescribed reset positions to be there restrained by said magnetic plate.

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**4,336,753**

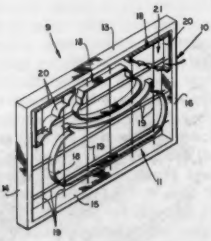
## RUG PRINTING SYSTEM

**Ted Vidalis, P.O. Box 1875, Dalton, Ga. 30720**

**Continuation of Ser. No. 919,862, Jun. 28, 1978, abandoned. This application Sep. 5, 1980, Ser. No. 184,400**

**Int. Cl.³ B41N** *1/24;* **B41F** *15/04;* **B05C** *17/06*

**U.S. Cl. 101—127** **2 Claims**



1. A stencil, for use in dye printing pile fabric wherein said stencil is placed against said fabric and at least two different dyes are applied through said stencil to dye said pile fabric, said stencil including a generally rigid frame disposable beyond the area to be printed, a plurality of divider walls within the confines of said frame for separating the pile of said pile fabric, each divider wall of said plurality of divider walls being disposable perpendicularly to said pile fabric and having a lower edge for engaging the backing of said pile fabric, means for supporting said divider walls comprising a first plurality of wires fixed to said frame and extending across said frame in a first direction generally parallel to the plane of said pile fabric, a second plurality of wires fixed to said frame and extending across said frame in a second direction generally parallel to the plane of said pile fabric, said second direction being angularly related to said first direction, each divider wall of said plurality of divider walls being fixed to at least some of said first plurality of wires and said second plurality of wires, and further including a third plurality of wires fixed to said frame and extending parallel to said first plurality of wires, each wire of said third plurality of wires being above one wire of said first plurality of wires, said second direction being generally perpendicular to said first direction.

**4,336,754**

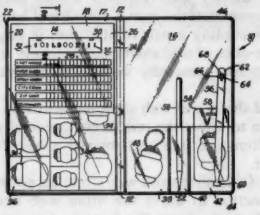
## PROPERTY IDENTIFICATION SYSTEM

**Warner Loeb, Stony Brook, N.Y., assignor to Identifax Nationwide Registry, Stony Brook, N.Y.**

**Continuation-in-part of Ser. No. 959,088, Nov. 9, 1978, abandoned, which is a continuation of Ser. No. 743,643, Nov. 22, 1976, abandoned. This application Oct. 3, 1980, Ser. No. 193,483**

**Int. Cl.³ B41L** *13/12;* **B41F** *15/02;* **B42D** *3/12*

**U.S. Cl. 101—127** **1 Claim**



1. A plurality of stencils for the marking of personal property with owner identification symbols, each stencil bearing a unique permutation of symbols and being assignable to one specific person who is an owner of personal property, each stencil comprising an elongated flat strip of flexible material, each stencil having a group of openings aligned substantially in a line, each of said openings being shaped to correspond to a recognizable symbol, a scribing tool having a hard pointed scribing tip for cooperating with said openings to engrave on items of personal property a group of symbols corresponding to the group of openings on the stencil, whereby the group of symbols thus scribed onto items of personal property with each stencil are the same for a specific person, at least two of said symbols at individually interspersed predetermined fixed spaced positions in the group of symbols on each stencil of the plurality of stencils being identical for all of the plurality of stencils and constituting identical master symbols identifying a specific master code list that is different for every different plurality of stencils, the balance of the symbols of each stencil, in combination with said two symbols, being a unique permutation different from the permutations of symbols on each of the remainder of the plurality of stencils, whereby the group of symbols on every single stencil is distinctly different from the group of symbols on every other stencil of the plurality of stencils by virtue of the unique permutation of symbols carried thereby, exclusive of said two symbols, and is the same as every other stencil of said plurality of stencils in respect of the common two said symbols, so that the singular group of symbols on each stencil can be associated with a specific owner of personal property and all of said singular groups of the plurality of stencils when engraved on an item of personal property can be associated with a single master list identified by said two symbols and each group can be associated with a common specific owner on said common specific master list.

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**4,336,755**

## DEVICE FOR THE AXIAL AND THE RADIAL SETTING OF THE FORM CYLINDER FOR REGISTER PRINTING

**Zbynek Liska, Adamov, Czechoslovakia, assignor to Adamovske strojirny, narodni podnik, Adamov, Czechoslovakia**

**Filed Aug. 6, 1980, Ser. No. 175,879**

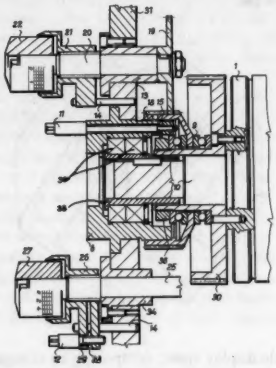
**Claims priority, application Czechoslovakia, Aug. 24, 1979, 5753-79**

**Int. Cl.³ B41F** *13/24*

**U.S. Cl. 101—248** **5 Claims**

1. A device for the axial and radial setting of the forme cylinder for register printing during printing operation, particularly on multicolor printing machines, which comprises: a first shaft mount, for engaging a first shaft of a forme cylinder, mounted in a first side wall of a printing machine; a first

toothed nut shiftingly arranged on said first shaft mount in engagement with a first gear fixed to a first gear shaft turnably arranged in the first side wall of the printing machine and in a bearing arrangement with said forme cylinder for axially adjusting the position of the forme cylinder, said first shaft mount having a recess and a securing screw which cooperate to form a securing clamp for securing the axial setting of said forme cylinder; a second shaft mount, which engages a second shaft



of the forme cylinder, mounted in a second sidwall of the printing machine, a second toothed nut shiftably arranged on said second shaft mount in engagement with a second gear fixed on a second gear shaft, a slideable drive gear, bearingly in communication with said second toothed nut and having a carrier pin which engages a recess provided in the side wall of the forme cylinder, mounted on said second shaft of said forme cylinder whereby the radial setting of said forme cylinder is adjusted.

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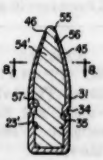
**4,336,756**

## JACKETED BULLET AND METHOD OF MANUFACTURE

**Charles J. Schreiber, Grand Island, Nebr., assignor to Hornady Manufacturing Company, Grand Island, Nebr.**

**Filed Aug. 16, 1978, Ser. No. 934,184**
**Int. Cl.³ F42B *11/10***
**U.S. Cl. 102—516** **10 Claims**



1. A pre-form jacket with an open upper end and closed bottom end adapted to have a core inserted through its open end for a jacketed bullet comprising:

a cylindrical tube of material which can be cold worked;

said tube comprising an upper portion, a mid portion and a base portion;

said mid portion having a substantially cylindrical inner surface;

the interior diameter of the mid portion being less than the interior diameter of the upper portion;

a base portion having an arcuate bottom surface and a substantially cylindrical interior surface;

the interior diameter of the base portion being less than the diameter of said mid portion;

the juncture of the bottom portion and the mid portion forming an annular ledge within the jacket;

an inwardly extending ring integrally formed with the top edge of said annular ledge;

said inwardly extending ring having a downwardly and inwardly sloping upper surface and an upwardly and inwardly sloping bottom surface forming a knife edge; and

the inner surface of the mid portion being joined to the inner surface of the upper portion by a frusto-conical surface.

6. A bullet comprising:

an outer jacket of a cold-workable, metal composition;

an inner core of a high density malleable metallic composition;

said jacket comprising an upper portion, a mid portion and a base portion;

said mid portion having walls thicker than the walls of said upper portion and thinner than the walls of said base portion;

said base portion having a substantially cylindrical inner surface with an inner diameter less than the diameter of said mid portion forming an annular ledge between said mid portion and said base portion;

said annular ledge containing on its interior an annular, inwardly-extending ring spaced apart from the base of the bullet to engage and hold said core; and

said annular ring having a downwardly and inwardly sloping first surface and an under surface extending inwardly perpendicular to the wall of said jacket, the upper surface and under surface meeting in a knife-like edge.

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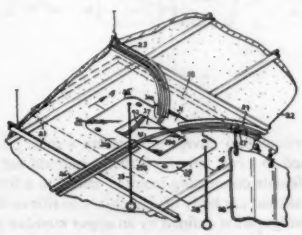
**4,336,757**

## TRACK SWITCH

**Ellis I. Toder, 341 Militia Hill Rd., Fort Washington, Pa. 19034**

**Division of Ser. No. 881,394, Feb. 27, 1978, Pat. No. 4,229,857.**
**This application Sep. 24, 1979, Ser. No. 78,247**
**Int. Cl.³ E01B *7/08***
**U.S. Cl. 104—102** **7 Claims**



1. A track switch for use in a curtain track system of the type comprising first and second branch tracks and a common track, said track switch being adapted for operative coupling to each of said first and second and common tracks, said track switch including,

(a) shiftable track means for selectively interconnecting said common track to one of said first and second branch tracks, said shiftable track means comprising first and second separate switch track sections fixedly intercoupled and movable as a unit, said first switch track section being movable into position to interconnect said first branch track to said common track when said actuating means is actuated in a first way, and said second switch track section being movable into position to interconnect said second branch track to said common track when said actuating means is actuated in a second way,

(b) actuating means for selectively shifting said shiftable track means to connect said common track as desired to either of said first or second branch tracks, and

(c) a hollow switch body having a closed top, a closed bottom having a central aperture, a pair of closed opposite side walls and a pair of opposite end walls intersecuring said top and bottom, one of said pair of end walls having a separate track-end receiving opening for each of said first and second branch tracks and the other of said pair of end walls having a track-end receiving opening for said common track, said shiftable track means comprising a slider unit held captive within said hollow switch body and closing the central aperture in said switch body bottom irrespective of the position of said shiftable track means.

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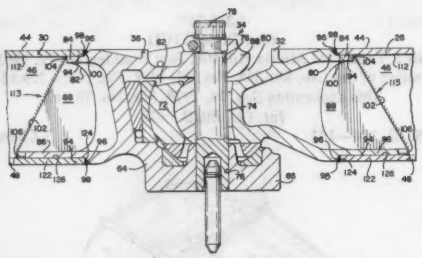
**4,336,758**

## RAILROAD CAR SILL-ARTICULATING DEVICE MEMBER CONNECTION

**Robert P. Radwill, Chicago, Ill., assignor to AMSTED Industries Incorporated, Chicago, Ill.**

**Filed Jun. 13, 1980, Ser. No. 159,213**
**Int. Cl.³ B61D *15/00*; B61F *3/12***
**U.S. Cl. 105—4 R** **7 Claims**



1. In an articulating device comprising a male connecting member joined to a rear sill of a forward railroad car body of a unit and a female connecting member joined to a front sill of a rearward railroad car body of said unit, said sills each having a box-like configuration defined by an upper member joined to spaced side members with an open bottom and end, said connecting members joinable by a pin and said device supportable on a railroad car truck located below said device, an improvement in a connection between each connecting member and sill comprising,

an inner end portion of said connecting member formed with a hollow body defined by a top wall and a bottom wall joined together by spaced sidewalls, said sidewalls having sloped end surfaces joining an end surface of said top wall at a point longitudinally offset from a joinder of said sidewall end surfaces with an end surface of said bottom wall,

said connecting member inner end sidewalls spaced to fit snugly against an inner surface of said sill side members with said connecting member inner end top wall and said sidewalls joinable to said sill by a series of internal weld seams to produce said connecting member-sill connection,

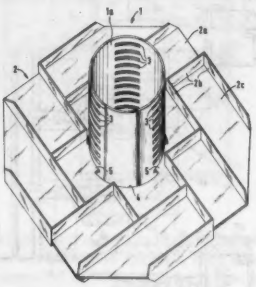
wherein said connection may withstand high forces imposed by static and dynamic loads transmitted between said car bodies and said truck during operation of said unit.

**4,336,759**

## ARTICLE DISPLAY STAND

**Wolf-Dietrich Hannecke, Rischenau Weg 6, 3410 Northeim, Fed. Rep. of Germany**

**Filed Aug. 3, 1977, Ser. No. 821,410**
**Claims priority, application Fed. Rep. of Germany, Mar. 3, 1977, 7706489[U]; Mar. 4, 1977, 7706490[U]; Mar. 4, 1977, 7706706[U]**
**Int. Cl.³ A47B *57/06***
**U.S. Cl. 108—144** **35 Claims**



1. An article display stand, comprising an elongated upright support extending in a first direction and having a plurality of recesses which are spaced from and located adjacent to each other in said first direction; and an article supporting element mountable in said support in any of a plurality of positions spaced longitudinally of said support, said article supporting element having a base plate which extends in a second direction transverse to said first direction and is provided with a central opening through which said support extends so that said support is located inwardly of said article supporting element and the latter is located outwardly of said support, said base plate having a projection which projects in said second direction inwardly of said opening and is detachably engageable with respective ones of said recesses so that, when said projection of said base plate of said article supporting element engages in one of said recesses of said support, said article supporting element is fixed in a respective one of said positions, said inwardly located support being resiliently deformable in said second direction so that said inwardly located support is deformed inwardly in said second direction in response to displacement of said article supporting element over said support in said first direction whereby said article supporting element can be displaced from one to another of said positions.

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**4,336,760**

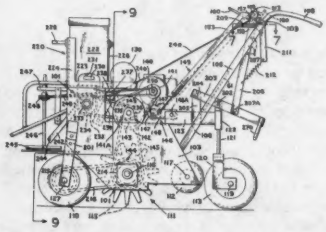
## EARTH WORKING APPARATUS INCLUDING AERATORS AND MATERIAL DISPENSERS

**Sidney Cohen, Spring Valley, and Robert Schlemmer, West Nyack, both of N.Y., assignors to Improved Lawn Equipment Corporation, Spring Valley, N.Y.**

**Filed Mar. 13, 1981, Ser. No. 243,368**
**Int. Cl.³ A01B *49/06*, *45/02***
**U.S. Cl. 111—11** **19 Claims**

7. A self-propelled aerator and material dispenser comprising a frame, front wheels rotatably secured to said frame, an aerator member including blades rotatably secured to said frame, rear wheels rotatably secured to said frame, a dolly wheel mounted on said frame for rotation about a vertical axis at a location rearwards of the rear wheels, support means for vertical movement of the dolly wheel between raised and lowered positions, said front wheels and rear wheels being positioned on said frame in relation to said dolly wheel and aerator member such that with said dolly wheel in said raised position the front wheels and dolly wheel define a common tangential plane which is at a level above the tips of the blades

of the aerator member and below said rear wheels thereby establishing an operative aerating position whereas in said lowered position of the dolly wheel the front wheels and dolly wheel define a common tangential plane which is below said aerator member and said rear wheels thereby establishing a transport position, handle means extending upwardly from said frame for manual guidance and propulsion of said frame, first linkage means between said support means and said handle means for effecting raising and lowering of said dolly wheel, said linkage means including a lever having one end pivotably connected to said frame means on the other end of said lever, a foot-engageable actuator, said lever being pivotably connected to said support means at a location intermediate said ends such that by the lever is pivotable between a first position in which the dolly wheel is lowered and a second position in which the dolly wheel is raised, locking means on said lever and said handle means for locking the dolly wheel in the lowered position, a motor on said frame, a drive pulley rotatably mounted on said frame, a first sprocket wheel secured to said aerator member, a second sprocket wheel secured to said front wheels, a drive means drivingly connecting said first and second sprocket wheels and driven by said drive pulley, a belt on said drive pulley driven by said motor, a tensioning pulley engaging said belt and having a first position in which the belt is tensioned and drive power is transmitted from the motor to the drive pulley and then to the aerator member and front



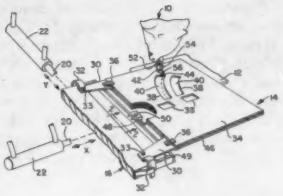
wheels and a second position in which the belt travels idly on the drive pulley and thereby the aerator member and front wheels are at rest, a plate pivotably mounted on said frame, said tensioning pulley being rotatably mounted on said plate for travel therewith, second linkage means between said plate and said handle means for pivotably moving the plate to move the tensioning pulley between said first and second positions, said second linkage means comprising a bracket pivotably mounted on said handle means for movement about a pivot axis, rod means pivotably connected to said plate and to said bracket, and a further actuator lever connected to said bracket to pivotably move the bracket and thereby said plate, said rod means having an axis along which a line of force is transmitted from said bracket to said plate, said line of force extending on opposite sides of said pivot axis when the tensioning pulley is in said first and second positions such that the second linkage means and thereby said tensioning pulley are in stable position for both positions of said tensioning pulley, a rotatable dispensing plate on said frame, drive means connecting said dispensing plate to said motor for rotation of said dispensing plate, a chute on said frame having an inlet and an outlet, said outlet facing said dispensing plate, hopper means mountable on said frame for storing material to be dispensed by said dispenser plate, said hopper means having an outlet, and feed means driven from said drive pulley for feeding measured amounts of material from the outlet of said hopper means to the inlet of said chute.

**4,336,761**

## AUTOMATIC SEWING APPARATUS

**Alfredo J. Magnan, Miami, Fla., assignor to Suave Shoe Corporation, Miami Shores, Fla.**

**Filed May 22, 1980, Ser. No. 152,482**
**Int. Cl.³ D05B *21/00***
**U.S. Cl. 112—121.12** **11 Claims**



**1.** In an automatic sewing apparatus having a sewing head, a pallet for holding a workpiece to be sewn, means for moving the pallet relative to the sewing head according to a predetermined pattern for stitching the workpiece and for backstitching, the sewing head including a presser foot for engaging the workpiece and needle means for stitching and backstitching the workpiece, and first and second control means for initiating stitching and backstitching, respectively, the improvement comprising means responsive to the operation of the second control means for preventing the presser foot from engaging the workpiece during backstitching.

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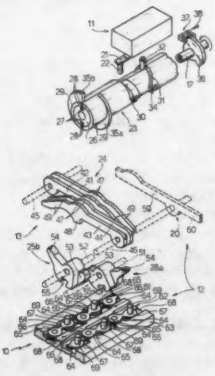
**4,336,762**

## ELECTROMECHANICAL ACTUATOR DEVICE FOR A SEWING MACHINE

**Nicolo' Giolitti, Ivrea, Italy, assignor to Arnaldo Vigorelli S.p.A., Pavia, Italy**

**Filed Apr. 17, 1980, Ser. No. 140,980**
**Claims priority, application Italy, Apr. 23, 1979, 67846 A/79**
**Int. Cl.³ D05B *3/02***
**U.S. Cl. 112—158 E** **20 Claims**



**6.** An electromechanical actuator device for a sewing machine, characterized by comprising a plurality of electromagnets **(11)**, each of which is arranged to be put into either a rest state or a working state, depending upon a respective electrical feed signal; at least one actuator member **(12)** connectable to a fabric conveying foot in the said sewing machine and arranged to assume either a rest position or a working position corresponding respectively to said rest state or working state of each of said electromagnets; a plurality of mechanical coupling means **(13)**, disposed between said plurality of electromagnets **(11)** and said actuator member **(12)**, and a drive shaft **(17)**

which is actuated by means of a power take-off and actuates the said mechanical coupling means (13); each of said mechanical coupling means (13) being arranged to be put either into a respective rest position or working position, depending on the state of a corresponding electromagnet (11), and to mechanically set said actuator (12) into either said rest position or working position; each of said mechanical coupling means including at least one element (29) axially slidable relative to the said drive shaft (17); the said slidable element (29) being arranged to be set into a rest position or working position following the receipt of a mechanical control signal produced by a corresponding electromagnet (11); said slidable element (29) comprises a zeroing recess (31) and a positioning recess (33) which are angularly displaced from each other and are arranged to cooperate with a peg (32) and with an armature (21) of said electromagnet (11) respectively, in order to set said element into said rest position or working position.

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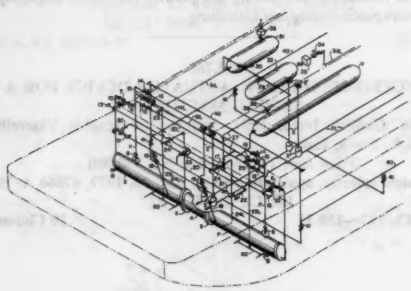
**4,336,763**

## MARINE VESSEL TRANSFER SYSTEM

**Robert C. Wolff, 955 Crystal St., New Orleans, La. 70124**

**Division of Ser. No. 411,848, Nov. 1, 1973, Pat. No. 3,883,269.**
**This application May 14, 1974, Ser. No. 469,807**
**The portion of the term of this patent subsequent to May 13, 1992, has been disclaimed.**
**Int. Cl.³ B63B *25/08***
**U.S. Cl. 114—74 R** **22 Claims**



1. A marine vessel for transporting and transferring material in a liquid or slurry form comprising:

(a) a hull;

(b) at least one cargo tank for storing the material in said hull; and

(c) a material transfer system connected to said cargo tank for transferring the material out of said cargo tank; said material transfer system comprising -

(i) at least two pumping chambers;

(ii) a common discharge line for said pumping chambers;

(iii) material inlet means connected between said cargo tank and said pumping chambers for alternately filling said pumping chambers with the material to be transferred;

(iv) material outlet means connected between said pumping chambers and said common discharge line for alternately transferring the material from said pumping chambers to said common discharge line;

(v) fluid pressure head means connected to said pumping chambers for supplying a pumping fluid pressure head to said pumping chambers for forcing the material out of said pumping chambers;

(vi) fluid exhaust line means connected to said pumping chambers for exhausting the pumping fluid pressure head from the pumping chambers after the material has been forced out of them;

(vii) cargo tank fluid line means connected between said exhaust line means and the cargo tank for increasing the static pressure head in said cargo tank; whereby the rate of flow of the material to said pumping chambers is increased and complete emptying of the cargo tank is enhanced; and

(viii) control means connected to said pumping chambers for controlling said inlet means, said outlet means, said fluid pressure hed means and said fluid exhaust line means in proper sequence; whereby the material can be transferred from the vessel's cargo tank(s) without all the problems and hazards found in the transfer systems for marine vessels used in the prior art.

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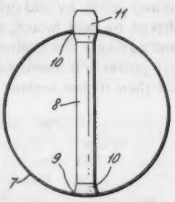
**4,336,764**

## MODIFICATION OF THE TOWER CONSTRUCTION IN A SPHERICAL TANK

**Arne Tonnessen, Moss, Norway, assignor to Moss Rosenberg Verft A/S, Moss, Norway**

**Continuation of Ser. No. 844,901, Oct. 25, 1977, abandoned.**
**This application Feb. 28, 1979, Ser. No. 15,944**
**Claims priority, application Norway, Oct. 26, 1976, 763650**
**Int. Cl.³ B63B *25/08***
**U.S. Cl. 114—74 A** **3 Claims**




1. In a marine vessel having a hull structure, a spherical tank adapted to contain liquefied gas and supported by an annular skirt having a vertical axis and positioned around the horizontal equator of said tank with said skirt being rigidly attached to said tank and to said hull whereby said tank is supported by said hull through said skirt with the respective upper and lower hemispheres of the tank being rigidly connected at their peripheries to said skirt, and a vertical tower which is rigid and is positioned within said tank with its axis substantially concentric with said axis of said skirt, said tower extending vertically between the top and bottom extremities of said tank with the ends thereof being rigidly connected to the respective of said extremities of said tank to thereby form an integral structure comprising said tower and said hemispheres.

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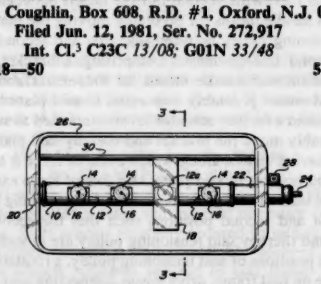
**4,336,765**

## VACUUM WORK PIECE HOLDER

**Vincent D. Coughlin, Box 608, R.D. #1, Oxford, N.J. 08901**

**Filed Jun. 12, 1981, Ser. No. 272,917**
**Int. Cl.³ C23C *13/08*; G01N *33/48***
**U.S. Cl. 118—50** **5 Claims**




1. A vacuum work piece holder, suitable for securing slides or the like, comprising:

(a) at least one elongated and generally cylindrical vacuum chamber including two ends;

(b) tray means of a length and width sufficient to contain said chamber said tray also including sides which are adapted

to rotatably support said chamber above said tray bottom; and,

(c) a plurality of ports extending generally in a linear path along the long axis of said chamber, and of a cross section sufficient to support a work piece securely thereon by suctional engagement.

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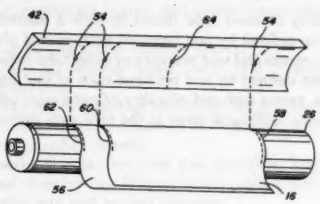
**4,336,766**

## ROLL FUSING APPARATUS FOR ELECTROPHOTOGRAPHY AND RELEASE AGENT MANAGEMENT SYSTEM THEREFOR

**James C. Maher, and Michael Carlotta, both of Sodus, N.Y., assignors to Xerox Corporation, Stamford, Conn.**

**Filed Nov. 24, 1980, Ser. No. 209,578**
**Int. Cl.³ G03G *15/20***
**U.S. Cl. 118—60** **3 Claims**




1. Roll fuser apparatus comprising:

a pair of fuser rolls one of which is heated and has an elastomeric outer layer, said rolls being sufficiently long to fuse toner images to various sizes of copy sheets passed therebetween wherein the edges of the sheets contact said heated roll at various positions along the longitudinal axis of said fuser rolls;

a release agent management system positioned to contact said heated fuser roll, said system comprising;

a hollow silicone oil containing member;

a compound wick supported by said hollow member, said wick including a relatively thick wick member utilized as a feeder and a relatively thin wick member said relatively thick wick member being in intimate contact with one surface of said hollow member, said relatively thin member being in contact with said outer layer;

said one surface of said hollow member having a plurality of outlet apertures therein, there being one aperture for each of said various positions, each aperture being spaced relative to one of said various positions whereby a quantity of silicone oil is applied to said elastomeric outer layer adjacent said various positions.

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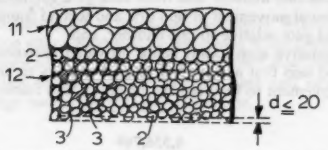
**4,336,767**

## SURFACE LAYER STRUCTURE OF AN INK TRANSFER DEVICE

**Hiroshi Wada, Kobe, Japan, assignor to Bando Chemical Industries, Ltd., Kobe, Japan**

**Filed Aug. 6, 1979, Ser. No. 63,727**
**Claims priority, application Japan, Aug. 4, 1978, 53-95600; Aug. 24, 1978, 53-103417**
**Int. Cl.³ B32B *3/26*; B41K *1/50, 1/52, 1/54***
**U.S. Cl. 118—264** **4 Claims**

1. An ink transfer device comprising a molded resilient ink transfer layer of heat compressed thermoplastic resin powder having particles of sizes of less than 50 microns in diameter with an ink transfer surface on one side thereof, with continuous pores therein, and thickness of 0.2 to 2 mm, and porosity of 8 to 30%, and inking surface variation of less than 20 microns; and a molded resilient ink storage layer having one side thereof connected to the side of said ink transfer layer opposite said ink transfer surface and consisting essentially of heat compressed thermoplastic resin powder having particles of sizes larger than that of said ink transfer layer and further having pore size, porosity and thickness greater than said ink transfer layer; whereby said pores in both said ink transfer and ink storage layers are continuous and communicated with each other; and




whereby the magnitude of ink flow current to the inking surface is limited by the ink transfer layer and not by the ink storage layer; and whereby the ink is substantially at said ink transfer surface when ink is in said ink transfer layer.

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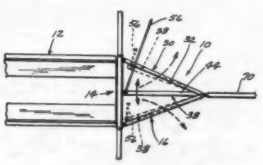
**4,336,768**

## ANIMAL SORTING GATE

**Robert L. Wagner, Hampton, Iowa, assignor to Ram Handler, Ltd., Kesley, Iowa**

**Filed Nov. 10, 1980, Ser. No. 205,263**
**Int. Cl.³ A01K *29/00***
**U.S. Cl. 119—155** **11 Claims**




1. An animal sorting gate assembly comprising,

first and second open frame members pivotally interconnected to pivot about a common vertical axis,

a gate member positioned to pivot about said common pivotal axis and between each of said first and second frame members, and

said first frame member including inner and outer vertical elements interconnected by top and bottom elements and said inner element functions as the axis of pivotal movement for said second frame member and said gate which are connected thereto,

said second frame member including an outer vertical frame element and top and bottom frame elements having their inner ends pivotally connected to said inner frame element of said first frame member,

said pivot connections for said second frame member being between the connections of said top and bottom elements to said inner vertical element of said first frame member,

said pivotal connection of said gate including a tube in which said inner element of said first frame member is positioned, said tube extending the substantial length of said inner element of said first frame and said second frame connection including sleeves at the ends of said top and bottom frame elements through which said inner element of said first frame member extends,

said sleeve on said bottom frame element of said second frame member abuts against the bottom element of said first frame member and said tube on said gate abuts against said sleeve on said bottom element of said second frame member and said sleeve on the top element of said second frame member being closely adjacent and between said tube and said top element of said first frame member whereby said gate is vertically confined between the sleeves of said second frame member and said sleeves of

the second frame member are vertically confined between said tube and top and bottom elements of said first frame member, respectively, the top and bottom elements of said first and second frame members being vertically spaced from one another and from said gate for noninterfering pivotal movement of said first and second frame members and gate relative to one another, and

cooperative stop means being provided between said gate and said first and second frame members to limit pivotal movement to between the planes of said frame members.

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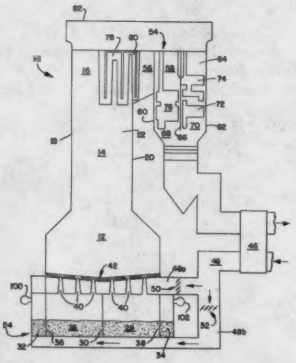
**4,336,769**

## INTEGRAL VAPOR GENERATOR/GASIFIER SYSTEM

**Ernest L. Daman, Westfield, N.J., assignor to Foster Wheeler Energy Corporation, Livingston, N.J.**

**Filed Mar. 31, 1981, Ser. No. 249,565**
**Int. Cl.³ F28D *13/00***
**U.S. Cl. 122—4 D** **9 Claims**



1. An integral generator/gasifier system comprising a vapor generator including an upright furnace section and a plurality of nozzles, each having one end registering with the interior of said furnace section, a gasifier extending adjacent said furnace section, means for introducing fuel to said gasifier, means in said gasifier for supporting a bed of adsorbent material for the sulfur generated as a result of the gasification of said fuel, means for passing air through said bed of adsorbent material to fluidize said material so that, upon gasification of said fuel, a substantially sulfur-free product gas is produced, the other end of said nozzles communicating with said gasifier so that the said product gas passes from said gasifier, through said nozzles and into said furnace section such that combustion of the gas and unreacted carbon occurs.

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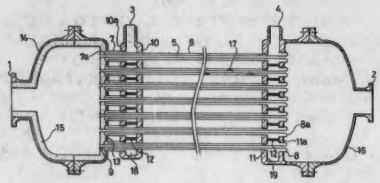
**4,336,770**

## WASTE HEAT BOILER

**Takayuki Kaneko, and Sadami Ninagawa, both of Chiba, Japan, assignors to Toyo Engineering Corporation, Japan**

**Filed Jul. 21, 1980, Ser. No. 170,454**
**Claims priority, application Japan, Jul. 30, 1979, 54-96148**
**Int. Cl.³ F22B *25/00***
**U.S. Cl. 122—266** **8 Claims**

1. A double-tube type waste heat boiler comprising, in combination, water chamber means; water vapor chamber means; both said chamber means being surrounded by an opposed pair of tube plates, respectively; a plurality of inner tube means extending in communication with and between a gas inlet channel means and a gas outlet channel means; a plurality of outer tube means arranged with one extending in concentric relation with each of said plurality of inner tube means with an annular gap therearound; a plurality of outermost tube means arranged with one extending in concentric relation with each of said plurality of inner and outer tube means with an annular gap therearound in such a manner that the tube end areas of said plurality of outermost tube means and said plurality of inner and outer tube means may be of a triplicate structure at least on the side of the gas inlet channel; and a plurality of annular or torus cap means connecting hermetically the ends of each of said plurality of outermost tube means and of each of



said plurality of inner tube means in such a manner that an annular gap defined by and between each of said plurality of inner tube means and said plurality of outer tube means and an annular gap defined by and between each of said plurality of outer tube means and said plurality of outermost tube means communicate with each other at the tube ends thereof.

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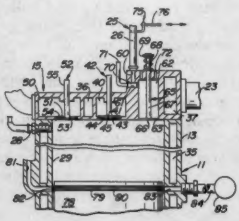
**4,336,771**

## SOLID FUEL BURNING INTERNAL COMBUSTION ENGINE

**Charles M. Perkins, R.F.D. 4, Albion, Ill. 62806**

**Filed Jul. 14, 1980, Ser. No. 168,596**
**Int. Cl.³ F02B *45/02***
**U.S. Cl. 123—23** **8 Claims**

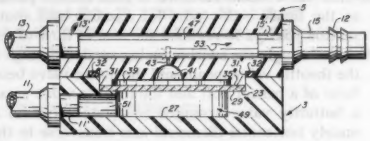


1. A solid fuel burning internal combustion engine comprising a power cylinder, a head closing one end of the power cylinder, a power piston reciprocable in said power cylinder toward and away from said head, an inlet valve in said head for passing air into said power cylinder, an exhaust valve in said head for passing combustion products from said power cylinder, a fuel valve in said head for retaining a quantity of fuel and opening on pressure reduction in said power cylinder to introduce said quantity of fuel to said power cylinder, ignition means in said cylinder for igniting said fuel, and including at least one piston ring, and piston ring cleaning means comprising an inlet oil passageway communicating with said power cylinder at bottom dead center of said piston ring via a first port, an outlet oil passageway communicating with said power cylinder at bottom dead center of said piston ring remote from said inlet oil passageway via a second port, wherein said first and second ports are within a plane defined by said piston ring, and oil moving means communicating with said inlet and outlet oil passageways along said plane of said piston ring for moving oil and combustion products from said piston ring.

## 4,336,772
## WATER VAPOR INJECTION SYSTEM

Don H. Young, 2215 N. 38th Way, Phoenix, Ariz. 85008, and Russell W. Wellman, 141-40 Dryke Rd., Sequim, Wash. 98382

Filed Feb. 11, 1980, Ser. No. 120,691
Int. Cl.[3] F02D *19/00*
U.S. Cl. 123—25 L 9 Claims



1. A vapor injection system for introducing water vapor into an internal combustion engine, said system comprising in combination:

a housing having a first chamber therein;

a container for holding liquid water, said container being unpressurized;

inlet means for conducting said liquid water from said container into said first chamber, said housing also having a second chamber therein;

filter means disposed between and separating said first and second chambers for filtering water passing from said first chamber into said second chamber;

orifice means extending from said second chamber into a third chamber for conducting liquid water in said second chamber to a boundary of said third chamber and effecting vaporization of said water at said boundary when the air pressure in said third chamber is substantially reduced from ambient atmospheric pressure; and

outlet means for conducting water vapor from said third chamber into a portion of a carburetor located above a throttle valve of the carburetor, the carburetor being connected to the internal combustion engine, said outlet means being airtight to cause air pressure in said third chamber to be substantially equal to air pressure in said portion of the carburetor.

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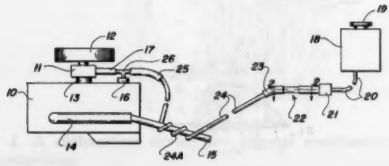
## 4,336,773
## ENERGY CONSERVATION APPARATUS FOR INTERNAL COMBUSTION ENGINES

Middleton M. Carouthers, 573 Briarwyck, Ballwin, Mo. 63011, and Robert L. Klamm, St. Charles, Mo., assignors to Middleton M. Carouthers, Ballwin, Mo.

Filed Jun. 30, 1980, Ser. No. 164,021
Int. Cl.[3] F02M *25/02;* F02D *19/00*
U.S. Cl. 123—25 B 12 Claims



1. Energy conservation apparatus for internal combustion engines having a carburetor for inducting fuel and air to form a combustible mix, and hot exhaust gas discharge means, said apparatus comprising:

(a) a source of vaporizable fluid; and

(b) fluid flow conducting means between said fluid source and the engine carburetor, including in fluid flow relationship:

(1) heat exchange means in advance of the engine carburetor for imparting engine exhaust gas heat to the fluid to vaporize the fluid,

(2) fluid flow restricting means having a non-adjustable fixed diameter and constantly open tube through which the fluid is directed, and

(3) a fluid connection at the engine carburetor, whereby the induction effect generated by the engine at the carburetor establishes a negative pressure in said fluid flow conducting means to move the vaporizable fluid past said heat exchange means and into the carburetor.

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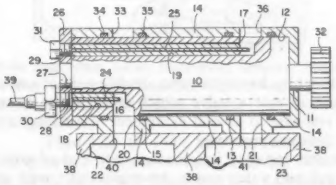
## 4,336,774
## ROTATING IGNITER FOR ENGINES

Louis Forde; L. Gregory Forde; Alonzo Forde; Alfredo Forde, and Raymond Forde, all of 482 Berriman St., Brooklyn, N.Y. 11208

Continuation-in-part of Ser. No. 880,204, Feb. 22, 1978, abandoned, which is a continuation-in-part of Ser. No. 671,661, Mar. 29, 1976, abandoned. This application Jan. 3, 1980, Ser. No. 109,347
Int. Cl.[3] F02P *15/00*
U.S. Cl. 123—143 B 6 Claims

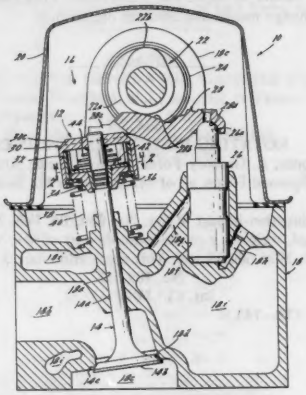


1. Apparatus for conveying igniters in an engine comprising: synchronizing casing means including first inspecting apertures means positioned in radial alignment with first outlet means positioned in said casing, and second inspecting aperture means positioned in radial alignment with second outlet means positioned in said casing, conveying means consisting of rotary member means rotated within said casing; means for rotating the member in synchronism with the engine rotations, said rotary member having disposed within first firing means and second firing means arranged at equal angular relationship with each other and vary-distant from an end of said rotary member means, first orifice means intermediate said first firing means and said end of said rotary member means defining first channel means within said rotary member means, igniting elements removably fitted into said first channel means defining first conduit means, second orifice means intermediate said second firing means and said end defining second channel means, igniting elements removably fitted into said second channel means defining second conduit means within said rotary member means, said first and said second conduit means disposed in planes arranged parallel to the axis of the rotation of said rotary member means having journal means moving and resting in said casing means and in cover means mating and enclosing said rotary member within said casing means, said cover means includes a first predeterminely positioned bore, conducting means including an input connector removably fitted into said bore, said conducting means being connected to an energy source, wherein upon rotation said rotary member means places said 1st conduit means in alignment with said conducting means, wherein said 1st conduit means conveys supply from said source into said first outlet means, and wherein said second inspecting aperture is in registry with and providing access into said second firing means at a respective time in the cycle.

## 4,336,775
## VALVE SELECTOR

Lawrence L. Meyer, Northville, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Continuation of Ser. No. 640,132, Dec. 12, 1975, abandoned.
This application Feb. 1, 1980, Ser. No. 117,705
Int. Cl.³ F02D 13/06
U.S. Cl. 123—198 F 20 Claims



1. In a machine having a valve disabling device selectively operative to disable a valve which is normally opened and closed in response to pivotal movement of a rocker arm, said disabling device comprising:

drive means installed intermediate one end of said rocker arm and said valve and in driving contact with said one end of said rocker arm; and

means moveable from a valve enabling position preventing relative movement between said drive means and said valve for enabling said valve for normal opening and closing and moveable to a valve disabling position allowing relative movement between said drive means and said valve for disabling said valve.

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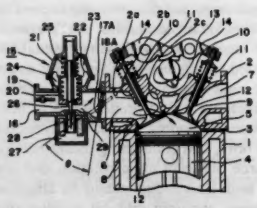
## 4,336,776
## SWIRL-INDUCING APPARATUS FOR INTERNAL COMBUSTION ENGINES

Masaharu Sumiyoshi; Setsuro Sekiya; Katsuhiko Motosugi; Hiroshi Takahashi, and Shuhei Toyoda, all of Toyota, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed May 31, 1979, Ser. No. 44,254
Claims priority, application Japan, Jun. 15, 1978, 53-72590
Int. Cl.³ F02B 31/00
U.S. Cl. 123—306 8 Claims



1. Apparatus for imparting a swirl to a flow of intake gas entering a cylinder of an internal combustion engine, the apparatus including an engine having a cylinder block which contains at least one cylinder, a cylinder head fastened to the block and having an intake valve seat for each cylinder, and a swirl-inducing suction passage for each cylinder, each suction passage having an upstream end communicating with a source of intake gas and a downstream end opening into the respective cylinder through the corresponding intake valve seat, wherein the improvement comprises:

throttle valve means mounted in each suction passage close to the intake valve port for opening and shutting the suction passage to regulate the rate of flow of intake gas therethrough, the swirl-inducing suction passage between the throttle valve means and the intake valve being in the form of a helical port and the throttle valve means being a butterfly valve arranged to rotate about an approximately horizontal diametral axis transverse to the intake mixture flow direction in the suction passage, the valve having a downstream-opening portion on the upper side of the suction passage and an upstream-opening portion on the lower side of the suction passage, the apparatus further comprising means for preventing flow past the upstream-opening portion in the general working range from idling through low-speed, low-load operation to concentrate the flow on the upper side of the passageway only through an initial opening range corresponding to engine operating conditions from idling through low speed, light-load, for converging the intake gas to flow eccentrically along said upper side of the passage from the throttle valve means to the intake valve seat to enhance the swirl imparted by the swirl-producing suction passage at low flow volumes, and said suction passage being opened on both sides of said approximately horizontal diametral axis upon further rotation of the throttle valve beyond said initial opening range, to distribute flow through substantially the entire intake port cross section at higher engine speeds and loads.

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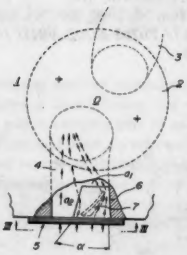
## 4,336,777
## INTAKE PASSAGE MEANS OF AN INTERNAL COMBUSTION ENGINE

Masanobu Yanagihara, Kawasaki; Yoichiro Kaneuchi, Yokohama, and Shoji Kobayashi, Yokosuka, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed May 6, 1980, Ser. No. 147,169
Claims priority, application Japan, May 15, 1979, 54-64469[U]
Int. Cl.³ F02B 31/00
U.S. Cl. 123—306 2 Claims



1. An intake passage means for an internal combustion engine with a cylinder head having an intake port bored therethrough so as to communicate with a combustion chamber, said intake passage means comprising a gasket connected to said cylinder head, an insert integrally formed with said gasket and extending into said intake port on one side thereof, and a guide plate integrally formed with said gasket and supported by said insert and shaped such that said guide plate narrows in a downstream direction inclined towards a circumference of an

inner periphery of said intake port and extends spirally over about one quarter of the circumference of the inner periphery of said intake port.

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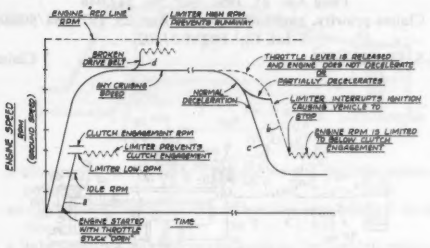
4,336,778

## SAFETY LIMITER FOR ENGINE SPEED

William A. Howard, Troy Township, Geauga County, Ohio, assignor to Delta Systems, Inc., Streetsboro, Ohio

Filed Feb. 29, 1980, Ser. No. 125,997
Int. Cl.[3] F02P 11/00; B60K 31/00; F02D 1/04
U.S. Cl. 123—334 22 Claims


ENGINE "RED LINE" RPM
LIMITER HIGH RPM PREVENTS RUNAWAY
BROKEN DRIVE BELT
THROTTLE LEVER IS RELEASED AND ENGINE DOES NOT DECELERATE OR PARTIALLY DECELERATES
ENGINE SPEED RPM (SECOND SPEED)
SET CRUISING SPEED
NORMAL DECELERATION
LIMITER INTERRUPTS IGNITION CAUSING VEHICLE TO STOP
CLUTCH ENGAGEMENT RPM
LIMITER PREVENTS CLUTCH ENGAGEMENT
ENGINE RPM IS LIMITED TO BELOW CLUTCH ENGAGEMENT
LIMITER LOW RPM
IDLE RPM
ENGINE STARTED WITH THROTTLE STUCK OPEN
TIME

1. A method of controlling the operating speed of an internal combustion engine having an electrical ignition, an operator-actuated throttle control and means for sensing operator force upon the throttle control, and that drives a load through a centrifugal clutch, comprising the steps of: sensing during engine operation lack of deceleration of the engine speed upon removal of actuating force from the throttle control, and interrupting the ignition in the absence of sensed deceleration upon removal of actuating force from the throttle control until the engine speed is below that necessary to engage the centrifugal clutch.

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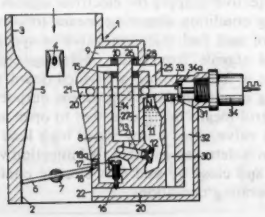
4,336,779

## CARBURATION DEVICES

Pierre Semence, Plaisir, France, assignor to Societe Industrielle de Brevets et d'Etudes S.I.B.E., Neuilly-sur-Seine, France

Filed Mar. 19, 1980, Ser. No. 131,672
Claims priority, application France, Mar. 22, 1979, 79 07309
Int. Cl.[3] F02M 7/00, 23/04; F02D 5/00, 1/04
U.S. Cl. 123—339 6 Claims



1. A carburetion device for internal combustion engine comprising:

a body formed with an induction passage for delivering an air/fuel mixture to an engine,

operator operable throttle means in said induction passage,

an idling duct connected to receive air from said induction passage and fuel from a float chamber through respective calibrated orifices and opening into said induction passage at a point which is located slightly upstream of the throttle means when the latter is in its minimum opening position,

passageway means connected to receive air and fuel to form a primary air/fuel mixture and to receive dilution air from said induction passage, said passageway means having an outlet opening into said induction passage at a location which is continuously downstream of the throttle to deliver an air/fuel mixture to said induction passage and by passage said throttle means, said passageway means having a common downstream portion supplied by two parallel branches one of which comprises a first channel formed with a calibrated orifice having a fixed flow cross-sectional area and the other of which comprises a second channel controlled by the solenoid valve,

said idling duct additionally having a downstream portion which opens into said passageway means through a calibrated port for delivery of an additional amount of primary air/fuel mixture into said passageway means,

a solenoid valve having two positions and located on said passageway means at a location which is downstream of dilution air delivery into said passageway means and upstream of primary air/fuel mixture delivery into said passageway means,

and a solenoid valve control circuit comprising engine speed sensing means and means for detecting deceleration of the engine, arranged and operating to supply the solenoid valve with energizing pulses having a variable duty cycle to prevent the engine speed from falling substantially below a set idling value and to give the solenoid valve a duty cycle which increases with the speed of the engine during engine deceleration above a preset speed ($N_O$).

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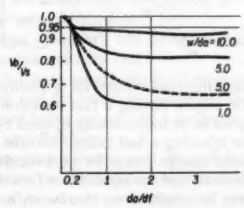
4,336,780

## JET CONTROL CARBURETOR

Katsuhiko Sugiyama, Aichi; Katsuyuki Ohsawa, Nagoya; Kenji Fujikake, Nagoya, and Yoshinori Idota, Nagoya, all of Japan, assignors to Kabushiki Kasiha Toyota Chuo Kenkyusho, Nagoya, Japan

Filed May 13, 1980, Ser. No. 149,626
Claims priority, application Japan, May 21, 1979, 54-62869; Sep. 10, 1979, 54-115987; Sep. 28, 1979, 54-126122; Oct. 23, 1979, 54-136610; Jan. 31, 1980, 55-10722
Int. Cl.[3] F02M 7/14
U.S. Cl. 123—438 31 Claims




1. A jet control type carburetor comprising:

an intake pipe having an intake passage formed in an inner wall thereof, said intake passage allowing an intake air to flow therethrough;

a venturi provided in said intake pipe, for increasing flow velocity of said intake air in said intake passage to reduce the pressure thereof;

a fuel nozzle opened into said intake passage and connected to a fuel supply source through a fuel passage for supplying the fuel into said intake passage from said fuel nozzle in order to introduce the mixture of air and fuel into said intake passage;

a throttle valve provided downstream of said venturi, for controlling the flow rate of said mixture of intake air and fuel;

a control air nozzle opened into said intake passage at a point upstream from said throttle valve, said point including the position of said throttle valve, said nozzle being connected to an air supply source through a control air passage for directly jetting the flow of said control air to the fuel

spurted from said fuel nozzle to afford a predetermined velocity component of said control air having a directional sense contrary to that of the spurted fuel, thereby to cause said control air to impinge upon said fuel spurted from said fuel nozzle and to restrain the fuel flow rate from said fuel nozzle, and

a throttle means provided upstream of said control air nozzle in said control air passage, for controlling the flow rate of said control air in accordance with a driving condition of said engine;

said control air nozzle having a predetermined inner diameter ($d_a$), being provided at a portion spacing apart from said fuel nozzle with a predetermined distance (W), and

a dimensional relationship of the spacing W between said fuel nozzle and said control air nozzle to the inner diameter $d_a$ of said control air nozzle being set as follows:

$$W/d_a \leqq 20,$$

whereby the control air injected from said control air nozzle has enough flow rate and flow velocity to obtain its desired impinging force, penetrates the flow of the intake air and reaches the flow of the fuel spurted from the fuel nozzle, so that the flow rate of the fuel and the air-fuel ratio of the intake mixture are accurately controlled over a wide range of the driving conditions of said engine.

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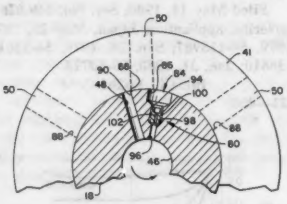
**4,336,781**

**FUEL INJECTION PUMP SNUBBER**

**Norbert W. Overfield, Bloomfield, Conn., assignor to Stanadyne, Inc., Windsor, Conn.**

**Filed Apr. 28, 1980, Ser. No. 144,328**
**Int. Cl.³ F02M *41/12***
**U.S. Cl. 123—467** **7 Claims**




1. In a liquid fuel injection system for a multiple cylinder internal combustion engine having a fuel injection nozzle for each cylinder adapted to be momentarily opened by a pulse of pressurized fuel for injecting a fuel charge into the cylinder, a positive displacement charge pump for periodically developing pulses of pressurized fuel for injection of fuel charges into the engine cylinders in synchronism therewith, a rotary fuel distributor providing a plurality of fuel outlet ports respectively connected to the nozzles, a distributor rotor member rotatable in synchronism with an associated internal combustion engine and having a fuel delivery passageway with a fuel delivery port sequentially registerable with the fuel outlet ports for conducting the fuel pulses from the charge pump to the fuel injection nozzles, a fuel delivery valve in the said fuel delivery passageway intermediate the charge pump and fuel delivery port for maintaining a positive residual fuel pressure at each nozzle after injection of fuel thereby, and fuel snubber means for damping a reverse pressure pulse from each nozzle when the nozzle closes at the completion of fuel injection thereby; the improvement wherein the snubber means comprises a snubber passageway in the rotor connected to the said fuel delivery passageway downstream of the fuel delivery valve and having a snubber port trailing the fuel delivery port for sequential registry with the fuel outlet ports for receiving a reverse pressure pulse from each nozzle after the fuel delivery port has rotated past the respective outlet port and a snubber passageway flow restrictor between the snubber port and said fuel delivery passageway for damping, downstream of the fuel delivery valve, the reverse pressure pulse conducted from each nozzle toward the fuel delivery valve and downstream of the fuel delivery valve and thereby permit the fuel delivery valve to maintain a positive residual fuel pressure at each nozzle after injection of fuel thereby.

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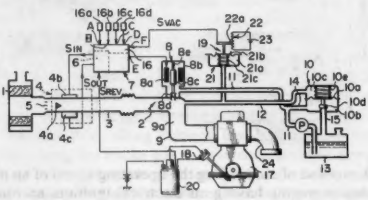
**4,336,782**

**FUEL FEED DEVICE FOR ENGINE**

**Norio Endo, Kameoka, and Tatsuro Nakagami, Kyoto, both of Japan, assignors to Mitsubishi Jidosha Kogyo Kabushiki Kaisha and Mitsubishi Denki Kabushiki Kaisha, both of Tokyo, Japan**

**Filed Apr. 21, 1980, Ser. No. 142,048**
**Claims priority, application Japan, Apr. 23, 1979, 54/50084**
**Int. Cl.³ F02M *51/02***
**U.S. Cl. 123—494** **7 Claims**




1. A fuel feed device comprising: an air flow rate detecting device to generate an electric signal having a frequency proportional to an air flow rate suctioned through an intake passage, an electromagnetically actuated fuel injection valve which is disposed downstream of said air flow rate detecting device to control the fuel feed rate into said intake passage, a fuel pressure regulator to maintain the pressure difference between a fuel feed pressure to said fuel injection valve and a suction pressure near a fuel outlet of said fuel injection valve constant, first electric control means for controlling opening and closing of said fuel injection valve so that it will synchronize with at least either a frequency of the electric signal generated by said air flow rate detecting device or a divided-down frequency thereof, operating condition detecting means for detecting engine operating conditions, said operating condition detecting means comprising a rotation speed sensor for sensing engine rotation speed and a load sensor for sensing engine load and for generating electrical signals respectively representative of engine rotation speed and load, second electric control means effective to apply the electrical signals generated by said operating condition detecting means to control opening and closing of said fuel injection valve in synchronism with the electrical signals from said operating condition detecting means at a frequency or a divided-down frequency of the operating condition detecting means output signals, said second control means being effective to open and close said fuel injection valve when a low speed high load engine operating condition is detected and said fuel injection valve is controlled to open and close by said first electric control means during other operating conditions.

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**4,336,783**

**FUEL VAPORIZER CARBURETOR FOR INTERNAL COMBUSTION ENGINE**

**Walter M. Henson, 1212 Major Dr., No. 1, North, Beaumont, Tex. 77701**

**Filed Jun. 19, 1980, Ser. No. 161,219**
**Int. Cl.³ F02M *31/00*; F22B *37/10***
**U.S. Cl. 123—557** **2 Claims**

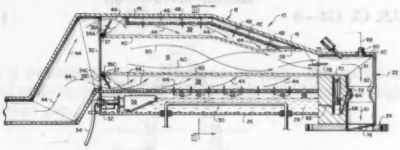
1. A carburetor for supplying a fuel/air mixture to an internal combustion engine of the type having an intake manifold, said carburetor comprising, in combination:

an elongated tubular housing having sidewall portions defin-

ing a float bowl for receiving liquid fuel and an elongated vapor mixing chamber overlying and disposed in fluid communication with the float bowl, said tubular housing have a combustion air inlet port disposed in communication with the vapor mixing chamber at one end, and a fuel/air mixture outlet port disposed in communication with the mixing chamber at the opposite end;

a fluid permeable wick assembly received within said housing and disposed between the float bowl and the mixing chamber;

a heating element received within the housing for transferring heat to fuel in the float bowl;



a closure valve movably disposed in the fuel/air mixture outlet;

an electrical actuator having a movable arm coupled to the closure valve;

a light sensitive transducer disposed in the fuel/air mixture flow path for generating a control signal in response to light emitted by flames propagating from the intake manifold; and,

a threshold detector control circuit having an input coupled to the transducer and an output coupled to the actuator for driving the closure valve into sealing engagement with the fuel/air mixture outlet in response to a said control signal.

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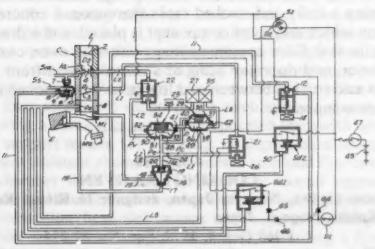
**4,336,784**

## EXHAUST GAS RECIRCULATION CONTROL SYSTEM FOR ENGINES

**Osamu Gotoh, Kurume; Yutaka Otobe, Niiza; Michio Kawamoto, Tokyo, and Akira Fujimura, Niiza, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan**

**Filed Oct. 6, 1980, Ser. No. 194,146**
**Claims priority, application Japan, Oct. 9, 1979, 54-130217**
**Int. Cl.³ F02M *25/06***
**U.S. Cl. 123—571** **16 Claims**



1. An exhaust gas recirculation control system for an engine applied to a vehicle, the engine having an intake passage with an auxiliary fuel supply means, and having a recirculation control valve provided in an exhaust gas recirculation line which extends from an exhaust passage of the engine and leads to the intake passage, the control system comprising, in combination: an expansible chamber provided in said recirculation control valve, a first suction line extending from a first suction port provided in the vicinity of a throttle valve in said intake passage to said expansible chamber, a second suction line extending from a second suction port provided at a venturi in said intake passage, pressure control valve means operatively connected to said suction lines for controlling the intensity of suction pressure from said first suction port, a first control valve means provided in said second suction line, a second control valve means provided for controlling said auxiliary fuel supply means to vary the rate of supply of auxiliary fuel, said first and second control valve means operating cooperatively in response to an operating condition of said engine or vehicle.

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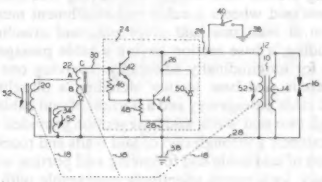
**4,336,785**

## MAGNETO IGNITION WITH FIELD-RESPONSIVE BIASING

**Richard D. Newberry, Springfield, Mass., assignor to Eltra Corporation, Toledo, Ohio**

**Filed Apr. 28, 1980, Ser. No. 144,520**
**Int. Cl.³ F02P *1/00***
**U.S. Cl. 123—605** **9 Claims**



1. A magneto ignition system for an internal combustion engine having a rotatable flywheel including a magnet, comprising:

a plurality of first coils having a first common magnetic flux path;

said first coils including an ignition primary coil and an ignition secondary coil;

said ignition secondary coil being magnetically coupled to said ignition primary coil;

a first solid state switch device connected to said ignition primary coil for switching a current therethrough;

said current being induced by a magnetic field of said magnet of said flywheel;

first means responsive to said magnet for driving said first solid state switch device towards a conductive state to allow a flow of current through said ignition primary coil;

second means responsive to said magnet for driving said first solid state switch device towards a nonconductive state for switching said current through said ignition primary coil to cause an ignition impulse in said ignition secondary coil;

third means responsive to a magnetic flux responsive to switching said current through said ignition primary coil in said first common magnetic flux path for driving said first solid state switch device toward said nonconductive state when said first solid state switch device is driven towards said nonconductive state by said second means responsive to said magnet;

said third means including a conductive member adjacent to said first coils;

said conductive member including a conductive path on a printed circuit board adjacent to said first coils;

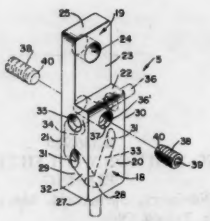
said printed circuit board having a plurality of conductive paths interconnecting said first coils, said first solid state switch device and said first and second means responsive to said magnet.

4,336,786

## ATTACHMENT MEMBER FOR SECURING THE ENDS OF CABLES IN A COMPOUND BOW

Walter L. Mannon, and Cary L. Cochran, both of Alum Creek, W. Va., assignors to Victor United, Inc., Chicago, Ill.

Filed Aug. 6, 1980, Ser. No. 175,891
Int. Cl.³ F41B 5/00
U.S. Cl. 124—23 R 11 Claims



1. A compound archery bow having wheels eccentrically mounted upon pivot pins disposed adjacent the bow limb tips, a cable passing around said wheels and having free ends attached adjacent said wheels, a cable end attachment member mounted upon at least one said pivot pin, said attachment member including, a base section having a cable passageway therethrough for longitudinally adjustably receiving one said cable end therein, said base section including a plurality of walls and said cable passageway and a portion of said cable end extend through two said walls, said base section provided with a cable bore extending through two of said walls and receiving another portion of said cable end following said portion within said passageway, lock means selectively engageable with said cable end within said base section, a pivot section joined to said base section and having means adapted to receive said pivot pin whereby, a circuitous cable end pathway is defined by said attachment member.

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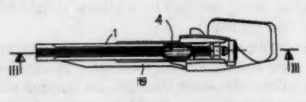
4,336,787

## PRE-COMPRESSED AIR WEAPON

Giacomo Cagnoni, Via Cassolnuovo 7, Abbiategrasso (Milan), Italy

Filed Jul. 21, 1980, Ser. No. 170,451
Int. Cl.³ F41B 11/00
U.S. Cl. 124—69 17 Claims



11. A weapon in the form of a compressed air gun with a frame, a barrel mounted therein and movable in the longitudinal direction, the rear extremity of said barrel being closable against a closure shoulder, a piston which is mounted in and displaceable within a cylindrical chamber for the aspiration and compression of the air, and a container with a closing valve, said container communicating with the barrel by means of a channel which is coaxial with respect to the barrel and a control mechanism for controlling the opening and closing of said valve, the longitudinal displacement of the barrel being coupled with that of the piston, a control lever means being provided for the displacement of the piston which control lever means is articulated on a body which comprises said cylindrical chamber and which lever is connected to the piston by means of a movable element, characterized in that on the piston there is provided a portion which protrudes in the generally radial direction and which protrudes toward the barrel through a slit provided in the body united to the cylindrical chamber and which is inserted in an oblong notch provided on the barrel; the surfaces which define said notch forming the engagement means for said radial portion; the length of said notch being less than the length of the run of the piston during the phase of aspiration and/or compression; a slide means being connected to said barrel so as to activate the control mechanism when the barrel is displaced in the axial direction.

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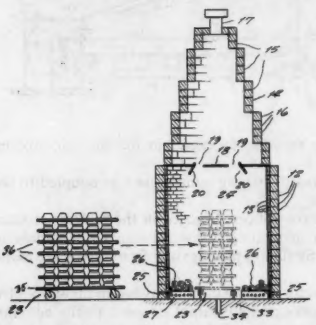
4,336,788

## HICKORY SMOKE BARBECUE OVEN

Ed Stein, 500 Laketower Dr. - 5 Pl., Lexington, Ky. 40502

Filed Oct. 8, 1980, Ser. No. 195,294
Int. Cl.³ A47J 37/00
U.S. Cl. 126—8 1 Claim



1. A hickory smoke barbecue oven, comprising, in combination, an oven component, a chimney thereupon, fixedly connected thereto, said oven component and said chimney being constructed of blocks, an inner liner of fire brick inside said oven member, said chimney being upwardly converged by stepped set backs, a smoke outlet pipe protruding upward from an upper end of said chimney; a steel plate between said oven component and said chimney, a plurality of vents through said plate adjustably closable by flap doors affixed to exterior handles; a doorway on the front side of said oven component, a steel door hinged in said doorway, a log rack along each side of an interior of said oven component, a gas burner under each said rack and gas valves on an exterior of said oven component front wall, a temperature control unit also mounted on said front wall; and a truck movable through said doorway, comprising a dolly and stacked racks thereupon, a concrete floor upon which said oven component is placed, and a drain opening in said floor communicating with said oven component interior; said doorway being at a center of said front wall, so that said truck is between said log racks when moved into said oven component.

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4,336,789

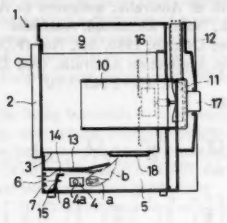
## COOKING GAS OVEN

Kazuo Ogawa, Nagoya, Japan, assignor to Rinnai Kabushiki Kaisha, Nagoya, Japan

Filed Oct. 4, 1979, Ser. No. 82,214
Claims priority, application Japan, Oct. 5, 1978, 53/136125
Int. Cl.³ A21B 1/00
U.S. Cl. 126—21 A 2 Claims

1. A cooking gas oven comprising: an oven main body; a heating housing having a front opening and closing door; a combustion chamber of forcible exhaust type disposed below said heating housing; said combustion chamber having a burner, and an air intake passage for introducing external air through an air intake opening in an outside surface of said combustion chamber into a position at which said burner is located; the improvement comprising: a regulating plate in said passage reducing the air passageway and flowing air over the burner at an accelerated speed whereby the burner flame re-

mains generally horizontal, away from any direct contact with said oven main body; a partition plate extending over said



burner, a passage gap being formed between said partition plate and said regulating plate, so that air is introduced through said passage gap.

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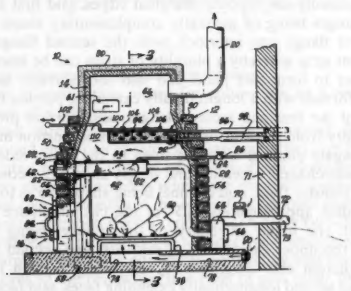
**4,336,790**

## COMBUSTION APPARATUS AND METHOD OF ASSEMBLY

**Gunther M. Bartsch, P.O. Box 1935, Zephyr Cove, Nev. 89448**

**Filed Jun. 30, 1980, Ser. No. 164,247**
**Int. Cl.³ F24C *1/00*; F24B *7/00***
**U.S. Cl. 126—58** **6 Claims**



**1.** The method of assembling a combustion apparatus of the type containing a fuel burning chamber, a circulated air chamber with a humidifier incorporated therewith, and a heat sink mechanism for heating adjacent fluid conduit transporting apparatus which includes: (1) placing a fire and heat resistant base means upon a supporting surface; (2) providing a first fire and heat resistant combustion chamber liner means upon said base; (3) placing a first support means upon said combustion chamber liner means; (4) supporting a circulated air chamber means having a humidifier means incorporated therewith onto said first support means; (5) Stacking, in alignment, a second fire and heat resistant chamber liner means atop said first combustion chamber liner means; (6) placing a second support means upon said second chamber liner means; (7) Supporting a combination heat sink means and adjustable damper means upon said second support means; (8) Installing a fluid transporting conduit means adjacent said heat sink means; and (9) stacking, in alignment, a fire and heat resistant vented closure means atop said second chamber liner means.

**2.** A combustion apparatus of the type containing a fuel burning chamber, a circulated air chamber with a humidifier incorporated therewith, and a heat sink mechanism for heating adjacent fluid conduit transporting apparatus which includes: a fire and heat resistant base means; a first fire and heat resistant combustion chamber liner means placed upon said base means; a first support means placed upon said first combustion chamber liner means; a circulated air chamber means having a humidifier means incorporated therewith; a second fire and heat resistant chamber liner means placed atop said first combustion chamber liner means; a second support means placed upon said second chamber liner means; a combination heat sink means and adjustable damper means placed upon said second chamber liner means; a fluid transporting conduit means located adjacent said heat sink means; and a vented fire and heat resistant means stacked in alignment upon said second chamber liner means.

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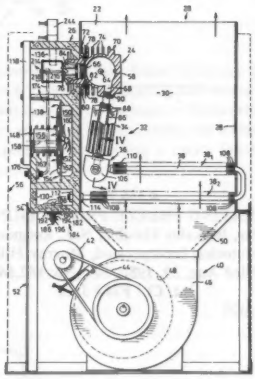
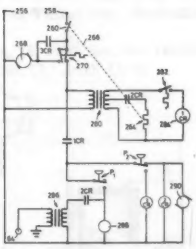
**4,336,791**

## PULSE COMBUSTION APPARATUS

**John A. Kitchhen, R.R. #3, Hastings, Ontario, Canada K0L 1Y0**

**Continuation-in-part of Ser. No. 148,624, May 12, 1980, Pat. No. 4,309,977. This application May 14, 1981, Ser. No. 263,635**
**Int. Cl.³ F24H *3/02***
**U.S. Cl. 126—110 R** **8 Claims**





**8.** In a pulse combustion apparatus including; a combustion chamber having a fuel charge inlet and an exhaust gas outlet; means associated with said combustion chamber inlet for admitting successive fuel charges to chamber, said means including inlet means for combustion air communicating with said combustion chamber inlet and including an air intake, blower means downstream of said intake and operable to deliver combustion air under pressure to said combustion chamber for starting, ignition means coupled to said combustion chamber and operable to initiate combustion in the chamber, gas supply means coupled to said combustion chamber inlet, and valve means adapted to control delivery of air/gas charges to said combustion chamber in accordance with the combustion cycle of the apparatus;

the improvement comprising:

a control system which includes:

starter means operable to activate said blower means when the apparatus is to be started;

first switch means responsive to a first predetermined air velocity in said air intake representing satisfactory operation of said blower means, said first switch means being coupled to and adapted to activate said gas supply means and said ignition means when said first predetermined velocity is achieved;

second switch means responsive to a second predetermined air intake velocity representing establishment of combustion in said combustion chamber and adapted to de-activate said ignition means and blower means while maintaining said gas supply when said second predetermined air intake velocity is achieved; and,

timer means coupled to said starter means, gas supply means and second switch means and adapted to shut off the gas supply means if the second switch means has not been operated after a predetermined time interval from initial operation of said starter means.

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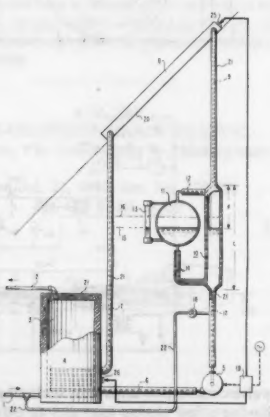
**4,336,792**

## SOLAR HEATING FREEZE PROTECTION SYSTEM

**Edwin N. Seiler, Berkeley Heights, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.**

**Filed Aug. 29, 1980, Ser. No. 182,668**
**Int. Cl.³ F24J *3/02***
**U.S. Cl. 126—420** **4 Claims**



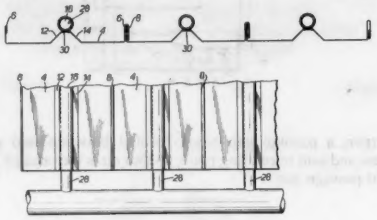
1. A solar energy system for heating water comprising a closed piping system including an elevated solar collector exposed to solar radiation and to freezing temperatures, storage means protected from freezing temperatures, pump means for circulating water in the system, said system containing both air and water and being arranged to permit drain-back of water from the collector and replacement thereof with air when the circulating means is not operating, characterized in that bypass means parallel the storage means, the bypass means enabling flow therethrough of the full volume of water circulated in the system and enabling substantially complete separation of air entrained in the water for accumulation in the storage means, whereby substantially no water flows through the storage means during operation.

**4,336,793**

## STRIP FOR FORMING A SOLAR PANEL

**James J. Ahearn, Hampton, and Kenneth C. Culph, Mount Waverley, both of Australia, assignors to Ahearn, Main & Stott Pty. Ltd., North Richmond, Australia**

**Filed Oct. 16, 1980, Ser. No. 197,435**
**Claims priority, application Australia, Oct. 23, 1979, PE1035**
**Int. Cl.³ F24J *3/02***
**U.S. Cl. 126—450** **9 Claims**



1. A strip for forming a combination solar energy collecting panel and roof surface, said strip being formed from sheet metal and having a flat upper side and a lower side, said upper side being coated with solar energy absorbent material, said strip being formed with first and second flanges extending longitudinally on opposite marginal edges, said first and second flanges being of generally complementary shape so that the first flange can interlock with the second flange of an adjacent strip whereby a plurality of strips can be interlocked together to form said panel and said roof surface, said strip being formed with a longitudinally extending portion intermediate of the first and second flanges, said portion projecting upwardly from the said flat upper side, said portion including an elongate channel which is open to the lower side of the strip, said channel receiving and snugly engaging a conduit for a heat transfer fluid, said channel being shaped so as to engage more than approximately 225° of the circumference of said conduit, the upper extremity of the channel being located above the upper extremities of said first and second flanges, and wherein said longitudinally extending portion includes first and second longitudinally extending faces, said faces being generally perpendicular to one another and being joined together by said elongate channel.

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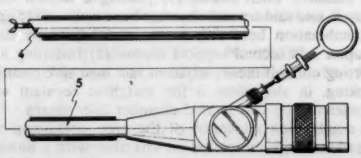
**4,336,794**

## GUIDE TUBE

**Toshio Chikama, Tokyo, Japan, assignor to Machida Endoscope Co., Ltd., Tokyo, Japan**

**Continuation of Ser. No. 968,024, Dec. 11, 1978, abandoned.**
**This application Oct. 20, 1980, Ser. No. 198,351**
**Claims priority, application Japan, Feb. 1, 1978, 53-10087[U]**
**Int. Cl.³ A61B *1/00***
**U.S. Cl. 128—4** **4 Claims**



1. A hollow elongated guide tube having open ends and a generally circular cross-section for insertion into the body through a body tube or cavity enabling a medical instrument to pass through said open ends to extend into the body, said guide tube comprising:

a porous material having exposed outer and interior surfaces, said interior surface of said porous material forming a substantially fixed circular cross-section, said circular cross-section having a diameter of a size to allow a medical instrument to pass therethrough,

a water-proof coating placed on at least the exposed outer surface to form a water-proof outer surface for said guide tube,

said guide tube being bendable to accommodate its insertion in the body, said porous material being compressible, said guided tube being bent and said porous material compressing at the bend maintaining said circular cross-section of said internal surface of said guide tube.

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**4,336,795**

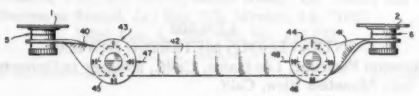
## DEROTATION BRACE

**Steven B. Nichols, 739 Wildwood Rd., West Hempstead, N.Y. 11552**

**Division of Ser. No. 13,470, Feb. 21, 1979, Pat. No. 4,263,901. This application Apr. 27, 1981, Ser. No. 257,862**

**Int. Cl.³ A61F *3/00***

**U.S. Cl. 128—80 A** **7 Claims**



1. An orthopedic appliance comprising:

a pair of connection means for connection to a respective shoe of a patient;

at least three elongated members, each having first and second ends, one of said elongated members comprising a central member and the other two of said elongated members each having ends which are pivotally connected to said central member at the respective opposite ends of said central member, the free ends of each other two elongated members being coupled to a respective connection means;

adjustment means for adjustably connecting said connection means to the respective free ends of said other two elongated members;

said elongated members extending between and spanning the distance between said connecting means to maintain the respective connecting means spaced apart;

said pivotal connections of said elongated members being intermediate said respective connection means;

means at said respective pivotal connections of said elongated members for releasing and locking said respective pivotal connections to permit pivoting of said other two elongated members relative to said central member, independent of the adjustable connection of said connection means to said respective free ends of said other two elongated members, and for locking of said elongated members relative to each other at a desired relative pivotal angular orientation between said elongated members; and

scale means at said respective pivotal connections for indicating the angular orientation of each of said other two elongated members relative to said central member about said pivotal connections.

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**4,336,796**

## ADJUSTABLE LOWER EXTREMITY SPLINT WITH SINGLE POINT SUSPENSION

**E. Trent Andrews, 2 Northgate Dr., San Francisco, Calif. 94127, and Robert Moore, 4010 East Ave., Hayward, Calif. 94542**

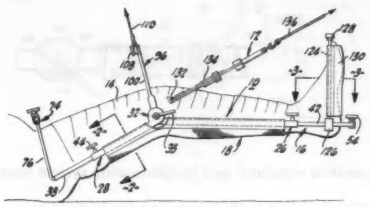
**Filed Aug. 4, 1980, Ser. No. 174,567**

**Int. Cl.³ A61F *5/04***

**U.S. Cl. 128—87 R** **9 Claims**

1. A lower extremity splint useable with an overhead suspension structure, said lower extremity splint comprising:

a frame structure having opposed first sides formed of lateral members, opposed second sides formed of cross structures connected to said lateral members, said lateral members each having a substantially centrally located articulation joint with locking means for select articulation and locked angular positioning of said lateral members on an axis common to said articulation joints, and a single support



means connected to said frame structure proximate said articulation joints for supporting said frame structure from a single support line connected to the overhead suspension structure; and, sling means connected to said frame structure adapted for supporting a user's lower extremity in said splint.

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**4,336,797**

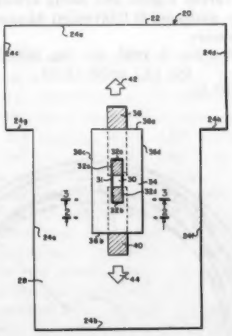
## ADJUSTABLE SURGICAL DRAPE

**Vincent Latucca, 245 E. 57 St., New York, N.Y. 10022, and Burton Bronsther, 195 Village Ave., Rockville Center, N.Y. 11570**

**Filed Aug. 25, 1980, Ser. No. 180,591**

**Int. Cl.³ A61F *13/00***

**U.S. Cl. 128—132 D** **12 Claims**



1. A surgical drape comprising:

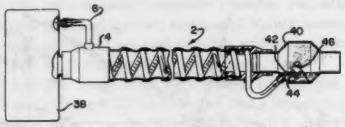
a flexible drapable main sheet having upper and lower surfaces, said main sheet having a fenestration therein; a closure member having upper and lower surfaces disposed in overlapping relation with said main sheet; and means for securing said closure member to said main sheet for sliding movement relative thereto for selectively obstructing any desired portion of said fenestration.

**4,336,798**

## MEDICAL CORRUGATED RESPIRATORY TUBE

**Anthony V. Beran, 3802 Teakwood, Santa Ana, Calif. 92704, assignor to Anthony V. Beran, Costa Mesa, Calif.**

**Filed Oct. 6, 1980, Ser. No. 194,582**
**Int. Cl.³ A61M *16/00***
**U.S. Cl. 128—200.14** **13 Claims**




8. A medical ventilator and humidification system comprising:

a ventilator assembly for generating pressurized gas;

a first hollow helical coil conduit having an inlet communicating with a first source of pressurized gas fluid from the ventilator assembly and an outlet, the inner circumference of the helical coil includes a plurality of regularly spaced creases extending substantially parallel to a longitudinal axis of the helix formed by the first helical coil conduit while the outer circumference of the helical coils are substantially smooth;

a pliable covering member of substantially transparent flexible plastic tape interconnecting the helical coils in an overlapping manner to form a larger second conduit having an inlet communicating with a second source of pressurized gas from the ventilator assembly and an outlet for enabling the exit of the gas from the ventilator assembly, the spacing of the coils and resiliency characteristics of the coil conduit defining sufficient parameters to provide a flow path along the second conduit;

a reservoir of fluid having a gas flow path therethrough connected to the outlet of the second conduit;

a nozzle member connected to the reservoir and to the outlet of the helical coil conduit and communicating with the flow path of the reservoir to vaporize the fluid therein for introduction into the gas carried by the second conduit.

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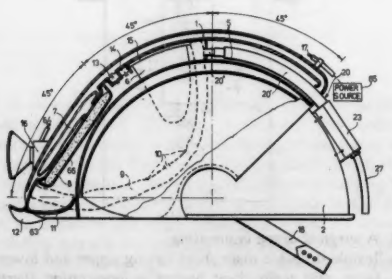
**4,336,799**

## APPARATUS FOR SUPPLYING OXYGEN TO A USER

**Istvan Almasi; Ferenc Kassai, and Attila Erdelyi, all of Budapest, Hungary, assignors to Banyaszati Aknamelyito Vallalat, Budapest, Hungary**

**Filed Sep. 3, 1980, Ser. No. 183,933**
**Int. Cl.³ A62B *18/04***
**U.S. Cl. 128—201.24** **11 Claims**




1. An apparatus for supplying oxygen to a user, said apparatus comprising:

a helmet;

a visor shiftably mounted on said helmet for normally assuming an out-of-use position and for assuming an in-use position over the face of said user upon manipulation thereby;

an oxygen-containing vessel attachable to a belt worn by said user;

conduit means connected at one end to said vessel and at another end to said visor for forming a gas-guiding channel between said vessel and a space formed between the face of said user and said visor upon a shifting thereof into said in-use position;

gas-flow control means on said vessel for enabling communication between said vessel and said conduit means, said gas-flow control means including first means for conveying oxygen-containing gas from said vessel to said enclosed space at a relatively slow rate during a substantially steady-state operation of said apparatus and second means for conveying gas from said vessel to said enclosed space at a relatively high rate during a transient state involving an initial charging of said enclosed space upon a shifting of said visor into said in-use position; and

force-transmitting means extending from said visor to said gas-flow control means for actuating same to connect said vessel to said conduit means upon a shifting of said visor into said in-use position.

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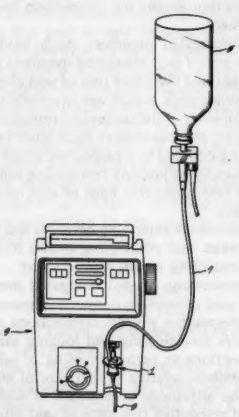
**4,336,800**

## INTRAVENOUS METERING DEVICE

**Giovanni Pastrone, Los Gatos, Calif., assignor to Oximetrix, Inc., Mountain View, Calif.**

**Filed Aug. 1, 1980, Ser. No. 174,666**
**Int. Cl.³ A61M *5/00***
**U.S. Cl. 128—214 F** **9 Claims**



1. A device which precisely meters fluids for intravenous delivery from a source of fluid to a patient, said device comprising:

a fluid pumping means for receiving fluid and for metering fluid so received to the patient, said fluid pumping means including a pumping chamber together with means for varying the volume of said pumping chamber;

an inlet means for permitting fluid to enter said fluid pumping means, said inlet means including a pumping chamber inlet in fluid communication with said pumping chamber, said inlet means also including a first valve means positioned within said pumping chamber inlet to control the entry of fluid into said fluid pumping means;

an outlet means for permitting fluid to exit said fluid pumping means, said outlet means including a pumping chamber outlet in fluid communication with said pumping chamber, said outlet means also including a second valve means positioned within said pumping chamber outlet to control the exit of fluid from said fluid pumping means;

a support structure having a device inlet formed therein for connection to the source of fluid; and

gas retention chamber means interposed between said support structure and said inlet means for providing a circuitous fluid path from said device inlet to said pumping chamber inlet such that fluid received by said fluid pumping means is free of gas bubbles, said gas retention chamber means including an upper chamber portion having a shape which enables the formation of a gas-liquid interface therein, said gas retention chamber means also including a lower chamber portion disposed below said pumping chamber inlet for holding liquid free of gas bubbles and a passageway means lower chamber portion disposed below said pumping chamber inlet for holding liquid free of gas bubbles and a passageway means connected between said lower chamber portion and said inlet means for passing liquid free of gas bubbles in an upward direction from said lower chamber portion to said pumping chamber inlet.

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**4,336,801**

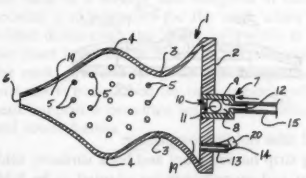
## DOUCHE NOZZLE

**Samuel W. Sentell, Rte. 7, Box 50; Jean S. Mendenhall, 579 N. Marlbourough Cir., both of Shreveport, La. 71106; Sallie S. Roberts, P.O. Box 80155, Baton Rouge, La. 70808, and C. Sherburne Sentell, Jr., Box 752, Minden, La. 71055**

**Filed Aug. 4, 1980, Ser. No. 174,833**

**Int. Cl.³ A61M *3/00***

**U.S. Cl. 128—239** **9 Claims**



1. A douche nozzle for discharging douche solution into the vaginal canal, having a hollow interior and comprising a base having a first surface tapering from the outer periphery of said base toward a central, longitudinal axis through the center of said base to define a narrow, round neck, said neck having a second surface continuous with said first surface and tapering away from said base and said axis to further define a bulbous enlargement spaced from said base and having a plurality of apertures communicating with said hollow interior, and said enlargement further characterized by a third surface continuous with said second surface and tapering toward said axis and away from said base to define a nozzle aperture communicating with said hollow interior, wherein the ratio of the inside diameter of said nozzle aperture to the inside diameter of said enlargement is about 1 to 7.

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**4,336,802**

## PARENTERAL SOLUTION CONTAINER FOR ASEPTIC MIXING

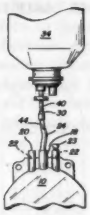
**Albert J. Stone, Buffalo Grove, and Michael D. Nissen, Crystal Lake, both of Ill., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.**

**Filed Jul. 28, 1980, Ser. No. 172,893**

**Int. Cl.³ A61J *1/00***

**U.S. Cl. 128—272** **6 Claims**

1. A flexible, collapsible container, carrying therewith a volume of solution comprising from 30 to 70 percent of the holding capacity of said collapsible container, said solution being selected from the group consisting of a carbohydrate parenteral solution and an amino acid nutrient parenteral solution, said container defining at least a pair of access ports, one of the ports being sealingly connected to a flexible, crimpable, thermoplastic tubing length of at least 1½ inches, and a sealed connector member carried on the outer end of said flexible thermoplastic tubing, said sealed connector member defining a sleeve including a sealing diaphragm in the bore thereof, said sleeve constituting an extension of said flexible thermoplastic tubing, and a second container which includes the other type



of said parenteral solutions in a volume approximately corresponding to the remaining empty volume of said first flexible collapsible container, said second container having a piercing spike positioned in said sleeve in sealingly-entered and diaphragm-rupturing relationship therewith, for transfer of the contents between said containers.

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**4,336,803**

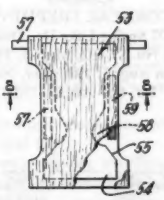
## SHAPED ABSORBENT PAD FOR DISPOSABLE DIAPERS

**Virginia L. Repke, Oak Forest, Ill., assignor to Johnson & Johnson Baby Products Company, New Brunswick, N.J.**

**Continuation-in-part of Ser. No. 865,464, Dec. 29, 1977, abandoned. This application Dec. 17, 1979, Ser. No. 104,518**

**Int. Cl.³ A41B *13/02***

**U.S. Cl. 128—287** **8 Claims**

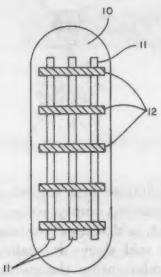


1. A shaped disposable diaper comprising; an impervious backing layer and a pervious facing layer, said layers being coextensive, and an absorbent pad disposed between said layers and spaced inwardly from the end margins and side margins of said facing and backing layers, said facing and backing layers having their greatest width at said end margins and a narrower width between said end margins, said pad having its widest portions adjacent the end margins and being narrower in the center portion of the pad, said pad having an indentation in each longitudinal edge adjacent said side margins, said indentations being disposed symmetrically opposite each other and being positioned approximately one-third the distance from one end of the pad to provide a short area between the one end of the pad and a first portion of the indentation, and a long area between the opposite end of the pad and a second portion of the indentation, the first portion of the indentation having substantially the shape of a minor portion of a circle having an arc from about 90° to about 120°, providing the deepest part of the indentation, a second portion of each indentation being formed by a line of uniformly straight slope from the deepest part of the indentation to the longitudinal side of the pad at an angle from about 30° to about 45° to the sides of the pad, the second portion of each indentation having a substantially triangular shape.

## 4,336,804
## SANITARY NAPKIN WITH GARMENT SUSPENSION ADHESIVE BUT WITHOUT RELEASE PAPER COVERING

Robert J. Roeder, Appleton, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.

Filed Mar. 23, 1981, Ser. No. 246,630
Int. Cl.³ A61F *13/16*
U.S. Cl. 128—290 R 5 Claims




1. A sanitary napkin with a body facing surface and a garment facing surface, comprising in combination an absorbent batt, a fluid impermeable baffle positioned between the batt and the garment of the wearer and adhesive attachment means on the garment facing side said attachment means including a plurality of discrete portions of pressure sensitive adhesive terminating prior to the ends of the garment facing surface said pressure sensitive adhesive being covered in spaced selected areas by a nonpressure sensitive adhesive.

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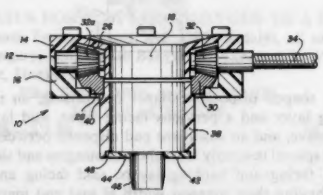
## 4,336,805
## CORNEAL TREPHINE

Heinz Smirmaul, 1207 Spring Lake Dr., Duncanville, Tex. 75137

Continuation of Ser. No. 17,492, Mar. 5, 1979, abandoned. This application Aug. 5, 1980, Ser. No. 175,577
Int. Cl.³ A61B *17/32*
U.S. Cl. 128—310 1 Claim



1. A corneal trephine comprising: a ring shaped body having a central opening therethrough of a diameter greater than the diameter of the cornea;
said ring shaped body having a chamber therein;
a ring gear mounted within said chamber of said ring shaped body for rotation about an axis extending through said ring shaped body;
cylindrical adapter means of transparent material and having first and second ends and being aligned with said central opening of said ring shaped body;
said cylindrical adapter means being releasably coupled at said first end to said ring gear for rotation about said axis;
said cylindrical adapter means having an opening therethrough of diameter greater than the diameter of the cornea;
said second end of said cylindrical adapter means including an annular groove;
transparent disk means having a diameter greater than the diameter of the cornea and being releasably received by said annular groove in said second end of said cylindrical adapter means to facilitate removal and disposal of said transparent disk means;
cylindrical cutting blade means for axially cutting the cornea and having a selectable predetermined diameter less than the diameter of said transparent disk means and being mounted concentrically on said transparent disk means;
flexible drive shaft means extending from said ring shaped body and transversely disposed to said axis;
means for connecting said flexible drive shaft means to said ring gear for rotating said cylindrical adapter means and said cylindrical cutting blade means about said axis; and
said connecting means including bearing means mounted within said chamber for supporting said ring gear and pinion gear means connected to said flexible drive shaft means and being rotatably mounted within said chamber for meshing with said ring gear.

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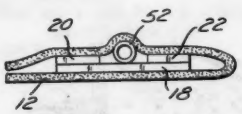
## 4,336,806
## MEDICAL TUBING HOLDER

John Eldridge, Jr., Balboa Island, Calif., assignor to Instranetics, Inc., Tustin, Calif.

Filed May 7, 1980, Ser. No. 147,632
Int. Cl.³ A61M *25/00*; F16L *3/08*
U.S. Cl. 128—348 3 Claims




1. A medical tube holder comprising:
(a) a backing strip having front and back surfaces, said strip having first and second sections adapted to be folded at their junction one on top of the other;
(b) a first magnetic material mounted on the front surface of said first section;
(c) a second magnetic material spaced from said first magnetic material and mounted on the front surface of said second section;
(d) a third magnetic material spaced from said first and second magnetic materials and mounted on the front surface of said second section between said first and second magnetic materials, said first magnetic material having magnetic attraction for said second and third magnetic materials;
said first, second and third magnetic materials being positioned so that said second and third magnetic materials mutually engage said first magnetic material when said strip is folded along said junction, the space between said first and third magnetic materials forming a first preferential tube receiving location, the space between said second and third magnetic materials forming a second preferential tube receiving location, said strip being adapted to secure tubing within said locations between said sections when in their folded position.

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## 4,336,807
## WAISTCOAT FOR THERAPEUTIC TREATMENT

Gerrit J. Benckhuijsen, Schaan, Liechtenstein, assignor to Temova Etablissement, Schaan, Liechtenstein

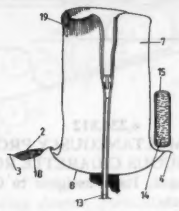
Filed May 20, 1980, Ser. No. 151,617
Claims priority, application Switzerland, May 21, 1979, 4739/79
Int. Cl.³ A61N *00/00*
U.S. Cl. 128—379 4 Claims

1. A waistcoat for therapeutic treatment adapted to closely fit the neck, shoulders and at least the upper trunk of a wearer and having front and back parts joined at the shoulder and side

lines of the trunk, an elastic band at the lower edge, sleeves, a separating fastener along the front, and a collar part extending upward from the front and back parts, characterized by:

being made of elastic knitted textile fabric comprising a mixture of long, non-hygroscopic polyvinyl chloride fibres and acrylic fibres spun on a worsted basis and suitable for generating static electricity on frictional movement against the skin of a wearer;

the collar, front and back parts each comprising at least a double layer of the fabric wherein the inner layer fits close to the skin, the layers are movable in sections in relation to



each other, and at least the collar and back parts having a mesh sufficiently large to allow evaporation of skin moisture of a wearer;

the collar part being at least twice as high as and covering the neck of a wearer and designed in such a way as to provide a stiff support for the neck when the top half is folded down onto the lower half while at the same time the inner layer of the textile fabric adheres to the skin of the neck, jaw and occipital region and the folded collar part exerts pressure on the neck region, and a pocket for a neck support is provided between the folded down upper and lower halves.

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**4,336,808**

## ULTRASONIC WAVE PROBE

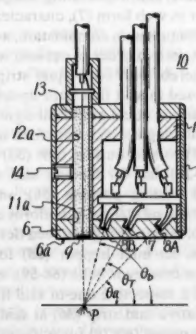
**Mitio Ohno, Kawasaki; Yoichi Shimada, Yokohama; Hiroshi Furuhata, Kasukabe; Ryoichi Kanno, Funabashi; Kuniyasu Kodaira, and Hirozi Matumoto, both of Kawasaki, all of Japan, assignors to Shozo Yoshimura and Hayashi Denki Co. Ltd., both of Kawasaki, all of, Japan**

**Filed Apr. 16, 1980, Ser. No. 140,852**

**Claims priority, application Japan, Apr. 24, 1979, 54-55342[U]**

**Int. Cl.³ A61B *10/00***

**U.S. Cl. 128—663** **8 Claims**



**1.** An ultrasonic probe for determining characteristics of blood flow in a body vessel comprising a casing having one wall provided with a substantially planar exterior reference face adapted for contact with the body surface adjacent the vessel to be tested, an ultrasonic wave transmitting and a pair of ultrasonic wave receiving vibrators fixedly mounted in said one wall in linear alignment with said transmitting vibrator interposed between said pair of receiving vibrators, each of said vibrators being arranged at an angle to the plane of said exterior face so that their respective lines of wave action intersect at a point substantially at the center of blood flow in the vessel being tested, said transmitting receiver being set at an angle of about 60°–65° to the said substantially planar exterior reference face, and therefore to the approximate direction of blood flow and the angle between the respective lines of wave action of each of said receiving vibrators and the said substantially planar exterior reference face and therefore to the approximate direction of blood flow being both acute angles and said lines of action being angularly equi-distract from the line of action of said transmitting vibrator.

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**4,336,809**

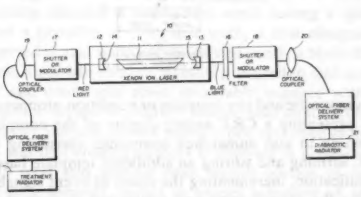
## HUMAN AND ANIMAL TISSUE PHOTORADIATION SYSTEM AND METHOD

**William G. Clark, Pittsford, N.Y., assignor to Burleigh Instruments, Inc., Fishers, N.Y.**

**Filed Mar. 17, 1980, Ser. No. 131,022**

**Int. Cl.³ A61B *6/00***

**U.S. Cl. 128—665** **13 Claims**




**1.** A tissue photoradiation system using a hematoporphyrin or hematoporphyrin derivative dye in tissue to be irradiated, said system comprising:

a. a xenon ion laser arranged for simultaneous lasing to produce deep blue light at wavelengths from about 406 to 427 nanometers and red light at a wavelength of about 627 nanometers;

b. partially transmitting mirrors arranged at opposite ends of a resonator for said laser;

c. one of said mirrors having a coating that substantially reflects said blue light and partially transmits said red light to produce a red light output;

d. the other of said mirrors having a coating that substantially reflects said red light and partially transmits said blue light to produce a blue light output;

e. means for transmitting said blue light output to said tissue to diagnose the condition of said tissue; and

f. means for transmitting said red light output to said tissue for treatment purposes.

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**4,336,810**

## METHOD AND APPARATUS FOR ARRHYTHMIA ANALYSIS OF ECG RECORDINGS

**Donald L. Anderson, San Juan Capistrano; Isaac R. Cherry, Mission Viejo; John A. Ripley, Newport Beach, and David T. Tanaka, San Juan Capistrano, all of Calif., assignors to Del Mar Avionics, Irvine, Calif.**

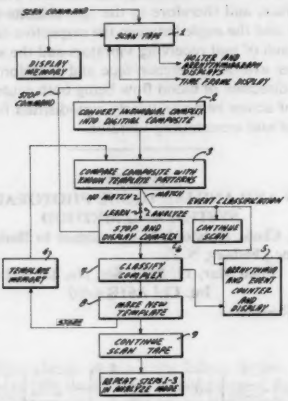
**Filed Sep. 30, 1980, Ser. No. 192,192**

**Int. Cl.³ A61B *5/04***

**U.S. Cl. 128—702** **40 Claims**

**1.** In a method for the analysis of a tape recording of ECG signals for normal and arrhythmic events, the steps of scanning the tape recording at high speed to create an electrical signal comprising a succession of complexes representing successive heart beats, generating composites comprising a plurality of digital words which represent measured parameters character-

izing each complex, comparing each successive composite with a plurality of known templates or conditions based on prior classifications of composites of the same tape recording and outputting an event signal if a match between a composite and a template or a condition is found, counting event signals corresponding to specific normal or arrhythmic events, and continuing to scan the tape until a no-match is found between




the composite and any template or condition, stopping the scan and presenting a CRT analog display of the complex corresponding to said unmatched composite, classifying the complex, forming and storing an additional template based on the classification, incrementing the count of event signals according to the classification and continuing to scan the tape to completion.

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**4,336,811**

## PROSTHESIS ELECTRODE WITH MULTI-LAYER MEMBRANE

**Theodore R. Beck, Seattle, and Robert T. Ruggeri, Kirkland, both of Wash., assignors to Electrochemical Technology Corp., Seattle, Wash.**

**Continuation-in-part of Ser. No. 13,915, Feb. 22, 1979, abandoned. This application Jul. 9, 1980, Ser. No. 167,201**

**Int. Cl.³ A61N *1/04***

**U.S. Cl. 128—784** **18 Claims**

1. A prosthesis electrode for electrically stimulating body tissue, said electrode comprising:

wire means for conducting an electric signal;

a metallic tip at the end of said wire means;

a non-metallic coating on said tip, said non-metallic coating being composed of a compound which can be oxidized and reduced cyclically in response to a biphasic pulse;

ion-conducting membrane means surrounding said tip and overlying said non-metallic coating for preventing the tip and said coating from contacting said body tissue;

said coating being in the form of a layer interposed between said tip and said membrane means;

said membrane means comprising a specific ion-conducting inner membrane layer adjacent said coating and comprising means for inhibiting movement into said body tissue of soluble ions of said coating which may be toxic to the body tissue;

said membrane means also comprising a non-specific ion-conducting outer membrane layer on the side of said inner membrane layer opposite said coating, said outer membrane layer comprising means for preventing changes in salt concentration in the body tissue adjacent said electrode during a biphasic pulse;

said outer membrane layer being composed of a material which is non-toxic to said body tissue.

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**4,336,812**

## MACHINE FOR SIMULTANEOUSLY PRODUCING TWO CONTINUOUS CIGARETTE RODS

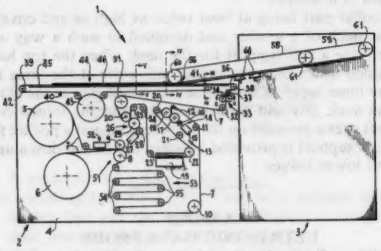
**Enzo Seragnoli, Bologna, Italy, assignor to G.D. Societa per Azioni, Bologna, Italy**

**Filed May 12, 1980, Ser. No. 149,000**

**Claims priority, application Italy, May 22, 1979, 49133 A/79**

**Int. Cl.³ A24C *5/14, 5/18, 5/39***

**U.S. Cl. 131—84 R** **7 Claims**



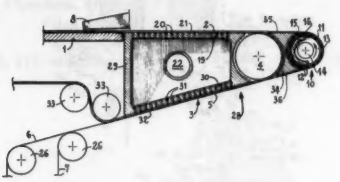
1. A manufacturing machine for simultaneously producing two continuous cigarette rods comprising a paper feed device (2) arranged to feed paper in web form (7) along a first determined path, and a device (3) for forming a substantially uniform layer (57) of shredded tobacco and for feeding said layer along a second determined path, said first and second paths intersecting at a station (56) for loading said layer of tobacco (57) on to said paper in web form (7), characterised in that said paper feed device comprises, in combination, a cutting unit (33) disposed in said first path in order to cut said web (7) along the longitudinal axis thereof into two equal strips (36); printing means (13-26) disposed in said first path upstream of said cutting unit (33) for marking equal graphical signs on said web (7) on each side of said longitudinal axis; feed means (40-9) for feeding said web (7) to said cutting unit (33) by way of said printing means (13-26) and for feeding said strips (36) separately through said loading position (56); and said layer of tobacco comprises two substantially uniform equal fillers (57) of shredded tobacco, said forming and feed device (3) comprising, in combination, an inlet hopper (68) for the shredded tobacco, two suction conveyor belts (58-59), each of which is arranged to support a respective one of said fillers (57) and to feed it on to the relative said strip (36) at said loading station (56), and distributor means (69-79) for withdrawing the shredded tobacco from said hopper (68), dividing it into two equal streams and continuously feeding said two streams each to below the respective said suction conveyor belt (58-59); trimmer means (64) being disposed below each of said suction conveyor belts in order to control the thickness of said fillers.

4,336,813

## STRIP GUIDING DEVICE, PARTICULARLY FOR CIGARETTE MAKING MACHINES

Enzo Seragnoli, Bologna, Italy, assignor to G.D. Societa per Azioni, Bologna, Italy

Filed Sep. 25, 1980, Ser. No. 190,797
Claims priority, application Italy, Oct. 8, 1979, 50484 A/79
Int. Cl.[3] A24C *5/04, 5/20, 5/14, 5/31*
U.S. Cl. 131—84 C 5 Claims



1. A strip guiding device, particularly for the automatic forward movement of at least a strip of paper along a substantially U-shaped path comprising a first and a second end branch connected to one another by an intermediate curved section, at least the said second branch, disposed downstream of the said curved section in the direction of advancement, extending, at least partially, along a conveyor device for the forward movement of the said strip, characterized in comprising at least a perforated pulley pivotally mounted about an axis passing through the centre of curvature of the said curved section, at least a chamber having a perforated wall disposed at least along the said second branch in contact with the said conveyor device, and suction means which communicate with the interior of the said pulley and the said chamber; a portion of the periphery of the said perforated pulley defining the said curved section of the path, and the remaining portion of the periphery of the said perforated pulley cooperating in a fluid-tight fashion with a fixed cylindrical surface; and the said conveyor device comprising an air-permeable ring-shaped belt conveyor.

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4,336,814

## PROCESS FOR EXPANDING TOBACCO

Larry M. Sykes, Ray G. Snow, both of Richmond, Roger Z. de la Burde, Powhatan, and Patrick E. Aument, Richmond, all of Va.; assignors to Philip Morris Incorporated, New York, N.Y.

Continuation of Ser. No. 822,793, Aug. 8, 1977, abandoned. This application Sep. 5, 1979, Ser. No. 72,647
Int. Cl.[3] A24B *3/18*
U.S. Cl. 131—291 3 Claims

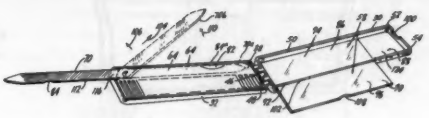
1. In the method of expanding tobacco which comprises the steps of (1) impregnating the tobacco with liquid carbon dioxide under conditions such that substantially all of the liquid carbon dioxide is maintained in liquid form so impregnate the tobacco with the liquid carbon dioxide, (2) subjecting the liquid carbon dioxide-impregnated tobacco to conditions such that the liquid carbon dioxide is converted to solid carbon dioxide and (3) thereafter subjecting the solid carbon dioxide-containing tobacco to conditions whereby the solid carbon dioxide is vaporized to cause expansion of the tobacco, the improvement which comprises: (i) utilizing as the tobacco which is employed in step (1) a tobacco which has an OV content of from about 17 to about 30%, (ii) conducting the impregnation step under pressure in the range of from about 250 psia to about 450 psia, and (iii) conducting the third step in such a manner that the moisture content of the expanded tobacco obtained from the third step is no higher than about 6%.

4,336,815

## GROOMING APPARATUS

Abraham Ross, 23 E. 26th St., New York, N.Y. 10010

Filed Oct. 6, 1980, Ser. No. 194,006
Int. Cl.[3] A45D *24/08*
U.S. Cl. 132—143 9 Claims



1. A combined comb and nail treatment device comprising a housing, said housing including a first housing element and a second housing element, said first housing element pivotably secured to said second housing element, said first housing element including a base and side walls and an open mouth portion, said second housing element including a base and side walls and another open mouth portion, said base and said side walls of said first housing element defining a first cavity in said first housing element, said base and said side walls of said second housing element defining a second cavity within said second housing element, a comb, said comb having a spine portion and a plurality of elongated teeth, a first elongated notch dispersed in said spine portion of said comb, a blade-like element, said blade-like element pivotably secured to said spine portion of said comb, said comb removably engaged within said first cavity, means to entirely confine said comb within said first cavity and said second cavity when said open mouth portion of said first housing element is disposed in juxtaposed relationship over said another open mouth portion of said second housing element, means to extend a portion of said blade-like element outwardly from said first notch of said comb, means to secure said portion of said blade-like element against rotation when said portion of said blade-like element is extended outwardly of said first and said second housing element are juxtaposed over one another, wherein said means to secure said portion of said comb against rotation includes a second notch, said second notch being disposed in one of said side walls of the said second housing.

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4,336,816

## DEVICE FOR CLEANING SMALL OBJECTS, ESPECIALLY DENTURES

Eberhard Horz, Glashutten; Robert Wirsing, Neu Isenburg, and Gunter Hoffmann, Hofheim, all of Fed. Rep. of Germany, assignors to Braun Aktiengesellschaft, Kronberg, Fed. Rep. of Germany

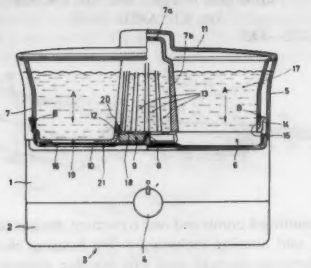
Filed Sep. 25, 1980, Ser. No. 190,783
Claims priority, application Fed. Rep. of Germany, Nov. 10, 1979, 7931846[U]
Int. Cl.[3] B08B *3/06*
U.S. Cl. 134—110 9 Claims

1. A device for cleaning small objects in a tank capable of containing a cleaning fluid and provided with electromagnetic agitation comprising:

a substantially cylindrical removable basket having side walls and a perforated bottom positioned in the tank;

basket insert means having a perforated bottom and being releasably connectable to said basket, said basket insert means including a bearing pin and the electromagnetic agitation for the device is made up of an agitator disc rotatably mounted in the tank and a motor below the tank including a coupling disc of a magnetic material for elec-

tromagnetically engaging said agitator disc, said bearing pin serving as a bearing for said agitator disc; and



filter screen means mountable between said perforated bottom of said basket and said perforated bottom of said basket insert.

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**4,336,817**

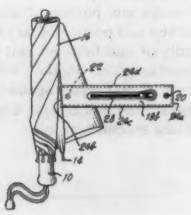
**UMBRELLA HAVING A POCKET COMPARTMENT**

**Rosella Shapiro, 3530 Lakeshore Dr., Chicago, Ill. 60603**

**Filed Apr. 25, 1980, Ser. No. 143,865**

**Int. Cl.³ A45B *25/00, 25/12***

**U.S. Cl. 135—16** **15 Claims**



1. An umbrella construction having a pocket compartment comprising:

a shaft;

a frame secured at one end to the shaft;

a water-repellent material cover attached to the shaft and the frame;

a first length of water-repellent material having spaced apart outer ends and longitudinal edges;

a second length of water-repellent material, having spaced apart outer ends, longitudinal edges and a longitudinally extending slit, said second length of water-repellent material having substantially the same width and length as the first length of material and positioned in overlapping relationship therewith, said lengths of material secured together at substantially their outer ends and longitudinal edges and secured to said material cover; and

closure means secured to said second length of material and positioned in relationship with said slit, so that said lengths of material and said closure means form a pocket or purse compartment for money and the like within the confines of the lengths of material, said pocket being capable of being selectively opened and closed by the selective opening and closing of said closure means.

**4,336,818**

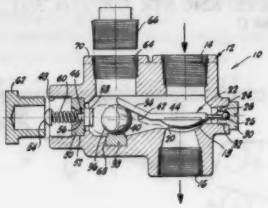
**SHOCK ACTIVATED SHUT-OFF VALVE**

**Hector A. Dauvergne, P.O. Box 884, San Leandro, Calif. 94577**

**Filed Jan. 2, 1981, Ser. No. 222,037**

**Int. Cl.³ F16K *17/36***

**U.S. Cl. 137—38** **10 Claims**



1. A gas valve for attachment to a gas line having a shut-off activated by a vibration shock comprising:

a. a valve housing having a gas inlet orifice and a gas outlet-orifice;

b. a flap gate pivotally mounted within said valve housing over said gas outlet orifice;

c. a ball pedestal support, mounted within said valve housing adjacent said gas outlet orifice; and

d. a ball supported on said valve housing:

wherein said flap gate has an extending lever contacting substantially the top of the ball and holding the flap gate away from said gas outlet orifice allowing gas passage through said valve and wherein said housing has internal cavity means for accommodating said ball when displaced from said pedestal support upon external vibration shock to said valve, said lever losing contact with said ball and said flap gate sealing said outlet orifice when said ball is so displaced.

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**4,336,819**

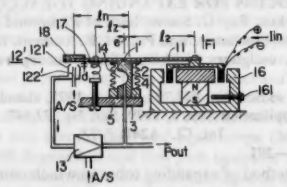
**PNEUMATIC CONVERTER**

**Tadashi Nishihara, Tokyo, Japan, assignor to Yokogawa Electric Works, Ltd., Tokyo, Japan**

**Filed Dec. 6, 1979, Ser. No. 100,728**

**Int. Cl.³ G05D *16/00***

**U.S. Cl. 137—85** **8 Claims**



1. A pneumatic instrument for use in instrumentation systems for developing an output force or displacement proportional to an input fluid pressure, said instrument comprising:

a bellows having an end plate movable in response to changes in the bellows internal pressure;

an output member for said instrument located outside of said bellows and connected to an external portion of said end plate for movement therewith; and

a coupling plate in said bellows extending between the two ends thereof and serving to couple said end plate directly to the other end of said bellows, said coupling plate being incompressible longitudinally and having at least a portion thereof which is transversely bendable, said coupling plate being offset from the center axis of said bellows to provide

for tilting movement of said end plate, and corresponding movement of said output member, with changes in the bellows pressure.

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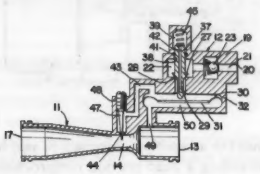
**4,336,820**

## METERING DEVICE FOR ADDING ONE FLUID TO ANOTHER

**Richard G. Jorgensen, Santa Ana, and Gerald G. Steele, Mission Viejo, both of Calif., assignors to Parker-Hannifin Corporation, Cleveland, Ohio**

**Filed Aug. 31, 1978, Ser. No. 938,555**
**Int. Cl.³ G05D *11/00***
**U.S. Cl. 137—100** **15 Claims**



1. A device for mixing two liquids comprising a venturi section and a regulator section; said venturi section having a main passage therethrough for a first liquid, said main passage including an inlet, an outlet and a restricted venturi throat between said inlet and outlet; and said regulator section having an auxiliary passage therethrough for a second liquid, said auxiliary passage including an inlet end and an outlet end that communicates with said main passage through a restricted orifice at said venturi throat, valve means in said auxiliary passage for controlling flow of the second liquid through said auxiliary passage, and a movable wall in said regulator section, said movable wall having opposed areas exposed respectively to the liquid pressure in said main passage between said inlet and venturi throat and to the liquid pressure in said auxiliary passage between said valve means and outlet end and being movable in said regulator section in accordance with the differential in pressures acting upon said opposed areas, and said valve means including means responsive to movement of said movable wall for operating said valve means between open and closed positions, whereby the liquid pressure differential across said restricted orifice may be equated to the liquid pressure differential between said inlet and venturi throat for fixed ratio mixing of the second liquid into the first liquid at said venturi throat.

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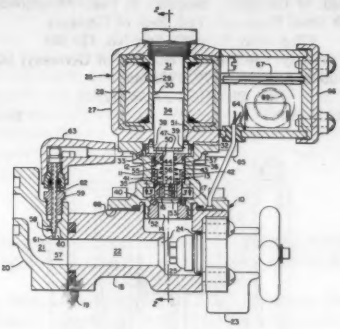
**4,336,821**

## SOLENOID-ACTUATED DRAIN VALVE

**Virgil L. Frantz, Salem, and Thomas D. Taylor, Roanoke, both of Va., assignors to Graham-White Sales Corporation, Salem, Va.**

**Filed Oct. 8, 1980, Ser. No. 194,992**
**Int. Cl.³ F17T *1/00***
**U.S. Cl. 137—187** **10 Claims**

1. A solenoid-actuated drain valve for draining matter accumulated by separation from compressed gas, comprising a valve body having inlet and drain ports connecting respectively to an outlet of a compressed gas reservoir and to atmosphere, valve means in said body for normally closing and alternately opening communication between said inlet and drain ports, solenoid means, said valve means opening and closing in response respectively to energizing and deengerizing of said solenoid means, means for sensing said accumulated matter, and control circuit means for energizing and deenergizing said solenoid means respectively on sensing of accumulated matter by said sensing means and on absence of said sensing, said control circuit means so long as said sensing means senses accumulated matter being adapted to cyclically control energizing and deenergizing of said solenoid means and responsive



opening and closing of said valve means in cycles of predetermined duration.

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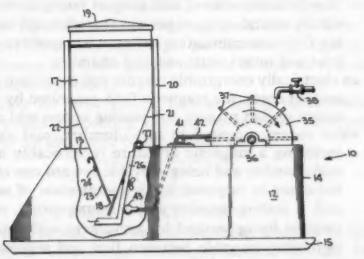
**4,336,822**

## WATER LIMER

**Jessie W. Carrell, P.O. Box 398, Oakman, Ala. 35579**

**Filed May 14, 1980, Ser. No. 149,762**
**Int. Cl.³ B65G *69/06***
**U.S. Cl. 137—268** **5 Claims**



1. Apparatus for dispensing powder-like material into a flowing liquid comprising:

a mixing chamber having side walls, upstream and downstream ends, and an open top;

a hopper containing said powder-like material and having a dispensing opening at its bottom, said hopper being supported above said mixing chamber;

rotatable wheel means disposed in the path of said flowing liquid for directing said flowing liquid into said chamber upstream of said hopper, said wheel means having an axis about which it rotates in response to the flowing liquid; and

impact means responsive to rotation of said wheel means for repetitively imparting vibrations to the material in said hopper and dispensing said material into the liquid in said chamber;

wherein said impact means comprises:

a dispensing plate pivotally mounted on said side walls for limited pivotal movement about an axis generally transverse to the liquid flow direction in said chamber, said dispensing plate extending generally along a portion of said hopper; and

further means responsive to rotation of said wheel means for periodically impacting said dispensing plate.

4,336,823

## SOLENOID VALVE

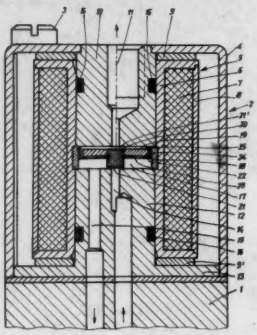
Bruno F. Staiger, Erligheim, and Kurt Stoll, Esslingen, both of Fed. Rep. of Germany, assignors to Festo-Maschinenfabrik Gottlieb Stoll, Esslingen, Fed. Rep. of Germany

Filed Mar. 12, 1980, Ser. No. 129,803

Claims priority, application Fed. Rep. of Germany; Mar. 17, 1979, 2910660; Aug. 18, 1979, 2933545

Int. Cl.³ F16K *31/06, 11/04*

U.S. Cl. 137—270 18 Claims



1. A solenoid valve for use on a body having an inlet port and an outlet port, comprising:

a pair of magnet cores axially spaced to define a chamber therebetween, one of said magnet cores having a pair of axially extending passageways therethrough each providing fluid communication between a respective one of said inlet and outlet ports and said chamber;

an electrically energizable magnet coil encircling said pair of magnet cores, the magnetic field generated by the energization of said magnet coil passing across said chamber;

valve means mounted in said chamber, said valve means including a magnetic armature reciprocably mounted in said chamber and being movable toward one of said magnet cores in response to an energization of said magnet coil, a sealing member and a return spring, said sealing member being secured for movement with said armature and being movable between first and second positions, said first position being a sealing engagement with the end of one of said passageways entering said chamber, said second position being spaced from said one end, said return spring biassing said sealing member into one of said first and second positions;

spacer means supporting said valve means being removably mounted in said chamber; and

means for providing access to said chamber to facilitate the removal of said spacer means and said valve means supported thereon therefrom so that said spacer means and said valve means can be turned over through 180° and reinserted into said chamber to thereby orient said sealing member at the other of said first and second positions, the magnetic force of said magnetic field sufficiently stronger than the return force of said return spring.

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4,336,824

## CARTRIDGE VALVE

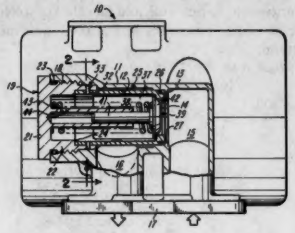
Robert J. Steineman, West Carrollton, Ohio, assignor to United Aircraft Products, Inc., Dayton, Ohio

Filed May 29, 1980, Ser. No. 154,592

Int. Cl.³ F16K *43/00*

U.S. Cl. 137—315 8 Claims

1. A cartridge valve, including a body providing an axially projecting cylindrical portion, a valve housing mounted to said cylindrical portion as an extension thereof, said valve housing being an element separable from said body and having an outer end providing a radially orienting valve seat, detachable means holding said valve housing and said body in a connected relation, said valve housing having a telescopic fit to said cylindrical portion of said body and said detachable holding means taking the form of a spring clip having bent over ends adapted to enter aligning apertures in telescoping members, a valve



contained within the assembly comprised of said body and said housing and including a head portion reciprocable within said valve housing, and a spring urging said valve toward an engagement of said head portion thereof with said valve seat, said spring being effectively interposed between said body and said housing.

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4,336,825

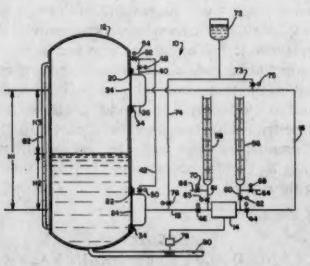
## LIQUID LEVEL CONTROL SYSTEM

Russell F. Pion, Warren, R.I., assignor to Factory Mutual Research Corporation, Norwood, Mass.

Filed Jun. 17, 1980, Ser. No. 160,275

Int. Cl.³ F16J *12/00*

U.S. Cl. 137—403 14 Claims



1. A system for controlling the level of liquid in a container comprising:

first conduit means communicating with an upper portion of said container;

second conduit means communicating with a lower portion of said container;

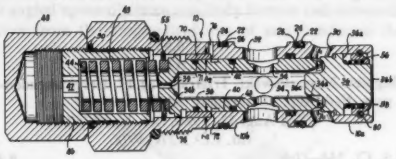
control means connected to said first and second conduit means for responding to differential fluid pressure from said conduit means and adjusting the level of liquid in said container accordingly, said first and second conduit means being connected to means for calibrating the liquid level adjusting means; and

means adjacent to said container and associated with each of said conduit means for transmitting the fluid pressure from said container portions, through said conduit means, to said control means while preventing fluid flow through said conduit means.

## 4,336,826
## CONTROL VALVE

**Frederick G. Grawunde, Painesville, Ohio, assignor to Fluid Controls, Inc., Mentor, Ohio**

**Filed May 2, 1980, Ser. No. 146,106**
**Int. Cl.³ F16K *31/122, 17/04***
**U.S. Cl. 137—540** **7 Claims**

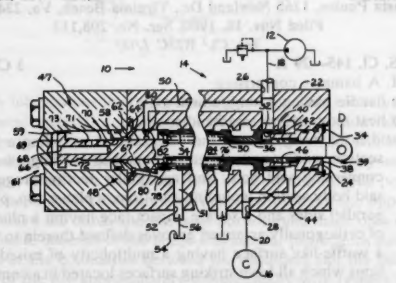


1. A control valve comprising:
(a) a valve body defining a first and a second plurality of circumferentially spaced, radially directed ports, and a stepped internal bore;
(b) an annular, elongated primary piston slidably supported within said stepped bore, said piston including a through bore;
(c) a valve seat engageable with one end of said piston for controlling the fluid communication between the first plurality of ports and the piston bore;
(d) biasing means acting between said valve body and said piston for urging said piston towards its flow interrupting position;
(e) the one end of said piston further defining an effective pressure area such that any fluid pressure present at the first plurality of ports establishes a fluid force on said effective pressure area which urges the primary piston towards its open position; and,
(f) pilot piston means mounted for relative movement with respect to said primary piston, said pilot piston means engageable with said primary piston upon predetermined movement for applying forces to said primary piston urging it towards its open position and said pilot piston means further operative to prevent a disproportionate increase in a relief setting of the control valve in the event a fluid generated back pressure is communicated to the second plurality of ports.

## 4,336,827
## VALVE ACTUATOR WITH HYDRAULIC LATCHING

**Kenneth F. Golan, Pekin, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.**

**PCT No. PCT/US80/01399, § 371 Date Oct. 17, 1980, § 102(e) Date Oct. 17, 1980, PCT Pub. No. WO82/01401, PCT Pub. Date Apr. 29, 1982**
**PCT Filed Oct. 17, 1980, Ser. No. 261,096**
**Int. Cl.³ F16K *11/07***
**U.S. Cl. 137—624.27** **6 Claims**



1. In a valve (14) having a housing (22), a bore (24) in the housing (22), an inlet and outlet port (26,28) in communication with the bore (24), a spool (30) slideably disposed in said bore (24) and moveable between a first position (D) at which said inlet port (26) is blocked from said outlet port (28) and a second position (E) at which said inlet port (26) is in communication with said outlet port (28), actuation means for controllably moving said spool (30) between said first and second positions (D,E), the improvement comprising:
pressure responsive means including valve means (48) for hydraulically latching said actuation means at said second position (E) in response to said actuation means being moved to said second position (E), said valve means (48) being integral with said actuation means.

## 4,336,828
## FIBRE-REINFORCED METALLIC LUSTER PIGMENTED TUBULAR CASING AND A PROCESS FOR ITS PRODUCTION

**Klaus Balser, and Walter Beger, both of Walsrode, Fed. Rep. of Germany, assignors to Wolff Walsrode AG, Leverkusen, Fed. Rep. of Germany**

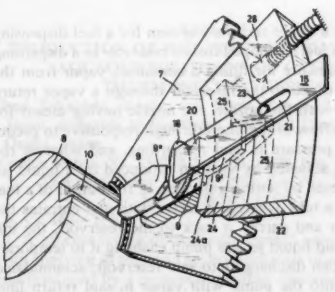
**Continuation of Ser. No. 954,442, Oct. 25, 1978, abandoned, which is a division of Ser. No. 720,258, Sep. 3, 1976, abandoned. This application Jul. 9, 1980, Ser. No. 167,056**
**Int. Cl.³ A22C *13/00***
**U.S. Cl. 138—118.1** **8 Claims**

1. A process for the production of metallic lusterous fiber reinforced tubular casing being able to shrink in dependence on the moisture level of the atmosphere comprising the steps:
(a) mixing and homogenizing pearlescent flake pigment with an alkaline solution of commercial-grade cellulose-xanthogenate;
(b) contacting and impregnating a long-fiber paper reinforced substrate with the homogenized mixture from (a) without previously applying a gel-like sealing coating;
(c) hardening the impregnated mixture in and on said substrate; and optionally
(d) coating the impregnated tubular casing thus obtained with a seamless coating of a vinylidene halide copolymer lacquer on the inside of the tubular casing.

## 4,336,829
## DOBBY MECHANISM

**Josef Brock, Viersen, Fed. Rep. of Germany, assignor to Maschinenfabrik Carl Zangs Aktiengesellschaft, Krefeld, Fed. Rep. of Germany**

**Filed Sep. 21, 1979, Ser. No. 77,887**
**Claims priority, application Fed. Rep. of Germany, Sep. 22, 1978, 2841280**
**Int. Cl.³ D03C *1/12***
**U.S. Cl. 139—76** **9 Claims**



1. A dobby mechanism having a design controlled coupling between a drive shaft and a first gear with the number of teeth

n, which first gear meshes with a second gear with the number of teeth 2n on an axle, on which second gear an eccentric device for the dobby movement is arranged, whereby the drive shaft and the first gear are coupleable with each other by means of a wedge radially movably mounted in a radially extending recess of the first gear, which wedge is controlled through a switching member according to said design, and in the coupled condition engages in said radially extending recess of the first gear and in an axially extending groove of the drive shaft, the improvement wherein

in the uncoupled condition the wedge is completely uncoupled from the drive shaft,

the switching member includes a switching rod, said switching rod being controlled according to the design,

said switching rod further includes a coupling member,

said wedge is formed with a groove in which said coupling member of said switching rod engages in a coupling range,

a ring having a slot and a radially inwardly directed overlapping portion,

said wedge has an outer end, said outer end engages in said slot of said ring in the uncoupled condition of the wedge from the drive shaft, said outer end is constrained by said radially inwardly directed overlapping portion overlapping said wedge adjacent said outer end in the coupled condition and uncoupled condition, respectively, of said wedge.

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**4,336,830**

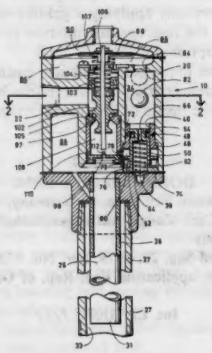
**VAPOR RECOVERY JET PUMP**

**James W. Healy, 54 Plymouth Rd., Wakefield, Mass. 01880**

**Filed Apr. 28, 1980, Ser. No. 144,249**

**Int. Cl.³ B65B** *3/18, 57/14*

**U.S. Cl. 141—59** **8 Claims**



1. For use in a vapor recovery system for a fuel dispensing system wherein fuel is pumped from a reservoir to a dispensing nozzle under pressure for filling a container, vapor from the container is returned to the reservoir through a vapor return line associated with the nozzle, the nozzle having means for shutting off the flow of fuel therethrough responsive to predetermined back pressure in said return line, and wherein the vapor return is actuated by vacuum produced by a liquid jet gas pump powered by jetting a fraction of the output of a fuel pump through a tube wherein it mixes with and entrains the returning vapor and carries it back to the reservoir, the improvement in said liquid jet gas pump enabling it to temporarily store, and then discharge into said reservoir, accumulated liquid carried into the pump with vapor in said return line, which comprises

means providing a surge chamber within said pump through which said vapor is drawn,

liquid collecting means upstream of said surge chamber to collect said liquid carried with said vapor in said return line, and

means for blocking flow through said surge chamber and for building up said back pressure in said return line when the liquid in said collecting means reaches a predetermined level, whereby said means in said nozzle for shutting off the flow of fuel is actuated when said liquid in said collecting means reaches said predetermined level.

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**4,336,831**

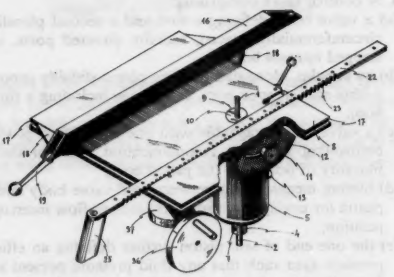
**TOOL**

**Zbigniew Mroczkowski, Tristramweg 17, Berchtesgaden-Stanggass, Fed. Rep. of Germany 8240**

**Filed Aug. 11, 1980, Ser. No. 176,847**

**Int. Cl.³ B27C** *9/00*

**U.S. Cl. 144—2 R** **8 Claims**



3. A machine for cutting materials such as wood and plastics, comprising a tool spindle, means for supporting said spindle for rotation, said spindle being adapted to be rotatably driven by a drive motor, a support table firmly connected to the spindle for supporting a workpiece to be cut, said table having a guide groove therein, a guide rail adapted to be positioned in said groove, a supporting plate attached to said rail, said plate having a coarse coating on its top side and having an opening therein that extends parallel to said guide groove, said table having an opening therein on the axis of said spindle, and a tool secured to said spindle and projectable through said opening in said table, said tool having at least one radially extending spiral rib formed on its outer periphery, the outer end of said rib being sharpened on its side which is adjacent to said table and said outer end thus forming a cutting edge, said spiral rib having a pitch within the range of from approximately 5° to approximately 15° relative to the axis of rotation of said spindle and said tool.

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**4,336,832**

**NON-SLIP HAMMER**

**Kosta Poulos, 1265 Newland Dr., Virginia Beach, Va. 23456**

**Filed Nov. 18, 1980, Ser. No. 208,113**

**Int. Cl.³ B25C** *1/00*

**U.S. Cl. 145—29 R** **3 Claims**

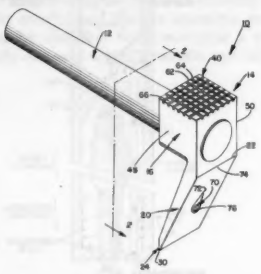
1. A hammer comprising:

a handle having a longitudinal axis;

a heat mounted on said handle;

said head being unitary and integral and including a body section, and a nail puller section, and a bridge section connecting said body and nail puller sections together, said body section including a bottom, a planar top, planar parallel sides and a square impact face having a plurality of orthogonally arranged grooves defined therein to form a waffle-like surface having a multiplicity of raised sections which all have striking surfaces located in a common plane, said nail puller including a planar top, a planar undersurface and a nail pulling hole defined therein, said nail puller planar top being angled with respect to said

body section to define a corner at the junction of said planar tops, said nail puller top being joined to said body planar top at a location so that said body planar top extends over said bridge section, said bridge section including a pair of extensions of said body section which are angled toward each other and a third section connecting said pair of extensions, said third section being oriented to be angled upwardly from said body bottom and outwardly away from the longitudinal axis of said handle so that



there is an increasing thickness of said bridge section from said body bottom to the intersection between said third section and said nail puller section, a pair of corners being defined at the intersections between said angled extensions and said third section, and a pair of fillets connecting said extensions to said undersurface of said nail puller section, one of said fillets being located at each of said corners, so that said body and nail puller sections are securely connected together.

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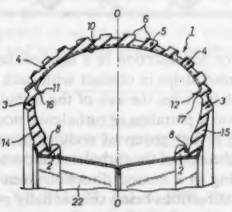
**4,336,833**

## TUBELESS PNEUMATIC TIRES

**Keizi Fuzioka, Kishiwada, and Masami Shinomiya, Izumi-Ohtsu, both of Japan, assignors to The Ohtsu Tire & Rubber Co., Ltd., Osaka, Japan**

**Filed Oct. 15, 1980, Ser. No. 197,068**
**Claims priority, application Japan, Oct. 29, 1979, 54-135462**
**Int. Cl.³ B60C** *9/04, 9/20, 13/00*
**U.S. Cl. 152—353 G** **8 Claims**



**1.** A tubeless pneumatic tire having a body made entirely of an elastic material comprising a tread, shoulders, sidewalls, bead portions and boundaries between the shoulders and the sidewalls and comprising cords embedded in the body and having a length not extending from bead portion to bead portion, elastic deformable portions provided between the opposite ends of the cords and the bead portions and made only of said elastic material of the body, and annular projections positioned at the boundaries between the shoulders and the sidewalls of the tire approximately symmetrically with respect to the equatorial line of the tire and each formed on the inner surface of the tire along a circumference centered about the axis of rotation of the tire, the ends of the cords on each side of the tire being curved, further extending toward the interior of the tire and being disposed within the annular projection.

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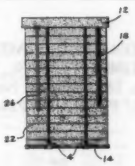
**4,336,834**

## VENETIAN BLIND

**Maurice Schaller, Clifton, N.J., assignor to Levolor Lorentzen, Inc., Lyndhurst, N.J.**

**Continuation of Ser. No. 741,951, Nov. 15, 1976, abandoned.**
**This application Dec. 22, 1977, Ser. No. 863,313**
**Int. Cl.³ E06B** *9/30*
**U.S. Cl. 160—168 A** **6 Claims**



**1.** A Venetian blind comprising an upper supporting housing having means for independently tilting and elevating a plurality of slats having concave and convex surfaces suspended therebeneath on ladders, each ladder being provided with two vertical braided strings, one disposed on the inside and the other on the outside of the slats and string-like cross-rungs connected to the respective strings for supporting the slats, the ladder terminating in a bottom bar; each slat being provided with slots for receiving a lift cord, a light colored surface on one face thereof and a contrasting darker colored surface on the other face thereof; the vertical strings of the ladders on one side of the blind being of a light color substantially blending with the light colored surfaces of the slats and the vertical strings of the ladder on the other side of the blind being of the contrasting darker color to blend with a similar color on the other surfaces of the slats; the cross-rungs connecting the respective strings of each ladder also being of the same contrasting darker color extending from the darker colored string up to from about one/half to three/quarters the length of each cross-rung; and a lift cord of the same darker contrasting color passing through the slots in the slats; whereby when the blind is in the closed and partially closed positions with the darker contrasting colored surfaces on one side of the slats with the lighter colored surfaces on the other side thereof the darker vertical strings of the ladders and the lift cord will be substantially unnoticeable and blend with the darker colored surfaces of the slats and the lighter strings of the ladder will blend with the lighter surfaces of the slats.

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**4,336,835**

## PRODUCTION OF WET-STRENGTH PAPER WITH AQUEOUS SOLUTIONS OF CATIONIC THERMOSETTING RESINS

**Hisao Takagishi, Kyoto, and Norio Kondo, Minoo, both of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan**

**Division of Ser. No. 78,713, Sep. 25, 1979, Pat. No. 4,287,110.**
**This application Apr. 14, 1981, Ser. No. 253,919**
**Int. Cl.³ D21H** *3/58*
**U.S. Cl. 162—164.3** **16 Claims**

**1.** A process for producing wet-strength paper, which comprises applying to paper an aqueous solution of a thermosetting resin produced by a process consisting essentially of

(i) heating an aliphatic dicarboxylic acid and a polyalkylenepolyamine to obtain a polyamidopolyamine, the molar ratio of the aliphatic dicarboxylic acid to the polyalkylenepolyamine being 1:1.0 to 1.2, and the heating being continued until the viscosity at 25° C. of a 50% aqueous

solution of the resulting polyamidopolyamine reaches 400 to 1,000 cps,

(ii) reacting the polyamidopolyamine with epichlorohydrin in an aqueous medium, the amount of epichlorohydrin being 1.6 to 1.7 moles per mole of the secondary amino group present in the polyamidopolyamine, the concentration of said reactants in the aqueous medium being 15 to 50% by weight, and the reaction being continued until the viscosity at 25° C. of a 15% aqueous solution of the reaction product reaches 30 to 150 cps,

(iii) controlling the concentration of aqueous reaction product solution to 15 to 30% by weight, and

(iv) adjusting the aqueous solution to pH 3 to 5 at 25° C.

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**4,336,836**

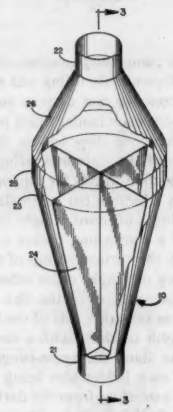
**HEAT RECLAIMER**

**Edward J. Horkey, 11208 S. Tomah St., Phoenix, Ariz. 85044**

**Filed Jan. 16, 1980, Ser. No. 112,804**

**Int. Cl.³ F24H *3/00*; F24C *1/00***

**U.S. Cl. 165—47** **5 Claims**




1. A heat reclaimer apparatus having an inlet section and an outlet section, comprising in combination:

transfer means having walls for transferring heat from a flow of fluid;

expansion means provided with diverging flow compartments for controlling the expansion of said flow of fluid;

said expansion means including splitter means for forming in conjunction with said transfer means walls said plurality of diverging flow compartments;

said splitter means comprising a plurality of connected plates radially arranged about the inlet axis of said reclaimer; and

said flow compartments each having at least one enclosing surface and a centroidal axis.

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**4,336,837**

**ENTIRELY PASSIVE HEAT PIPE APPARATUS CAPABLE OF OPERATING AGAINST GRAVITY**

**Daniel R. Koenig, Santa Fe, N. Mex., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.**

**Filed Feb. 11, 1981, Ser. No. 233,365**

**Int. Cl.³ F28D *15/00***

**U.S. Cl. 165—104.22** **13 Claims**

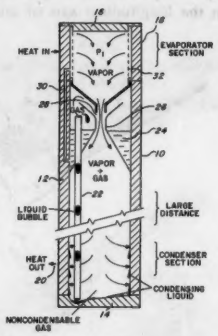
1. A heat pipe apparatus capable of operating against gravity comprising:

a heat pipe envelope comprising evaporator means and condenser means, said evaporator means being disposed gravitationally above said condenser means;

a gas and a working fluid within said heat pipe envelope, said fluid comprising a liquid and its vapor, said fluid comprising its liquid phase while in the condenser means and its vapor phase while in the evaporator means;

venturi means disposed between said evaporator means and said condenser means;

reservoir means disposed in the vicinity of said venturi means for containing said fluid in its liquid phase and said gas;




conduit means providing a path for said liquid and said gas between said condenser means and said reservoir means;

capillary wick means providing a path for liquid within said reservoir means to said evaporator means; and

means for introducing gas from said reservoir means into said venturi means.

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**4,336,838**

**HEAT EXCHANGE TURBULATOR**

**Richard J. Ely, 10307 S. Quebec Pl., Tulsa, Okla. 74136**

**Filed Jun. 19, 1981, Ser. No. 275,399**

**Int. Cl.³ F28F *1/40***

**U.S. Cl. 165—109 T** **10 Claims**

1. A turbulator for insertion in a heat exchange tube comprising two formed strips in contact with each other at places in a plane which includes the axis of the turbulator, each strip being formed into a plurality of turbulence nodules, said nodules comprising a first group of nodules extending in a first direction from the axis of the turbulator and a second group of nodules extending in a second direction from the axis of the turbulator, said directions being substantially perpendicular to each other, members of said first group alternating with members of said second group along the length of each strip, said strips being connected to each other at the places of contact between said strips.

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**4,336,839**

**DIRECT FIRING DOWNHOLE STEAM GENERATOR**

**William R. Wagner, Los Angeles; David E. Wright, Canoga Park, and Robert L. Binsley, Sepulveda, all of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.**

**Filed Nov. 3, 1980, Ser. No. 202,990**

**Int. Cl.³ E21B *36/00***

**U.S. Cl. 166—59** **9 Claims**

1. A direct firing downhole steam generator, comprising:

an injector assembly being defined by an inlet zone, an outlet zone and circumferential walls and having:

means for introducing air into said injector assembly;

means for introducing fuel into said injector assembly;

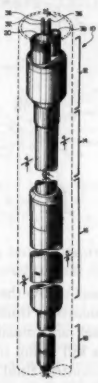
means for mixing said fuel and said air;

means for igniting said fuel air mixture; and

means for introducing water into and through said circumferential

walls of said injector assembly;

a combustion chamber being defined by an inlet zone, an outlet zone and circumferential walls and wherein said inlet zone of said combustion chamber is axially connected to said outlet zone of said injector assembly, and wherein said combustion chamber walls comprise a plurality of longitudinally-oriented water channels and wherein said



water channels are connected to said outlet zone of said injector assembly so as to receive the water from said injector assembly;

a heat exchanger being defined by inlet and outlet zones and inner and outer circumferential walls and wherein said inlet zone of said heat exchanger is axially connected to the outlet zone of said combustion chamber, and wherein the inlet zone of the annulus formed by said heat exchanger inner and outer walls is connected so as to receive the output of said water channels and wherein said heat exchanger further comprises a plurality of one-way valves oriented so as to permit water to be injected from said annulus into the core of said heat exchanger; and

a nozzle disposed so as to receive the output of said heat exchanger and inject high pressure products into a formation.

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**4,336,840**

## DOUBLE CYLINDER SYSTEM

**Thomas F. Bailey, Houston, Tex., assignor to Hughes Tool Company, Houston, Tex.**

**Division of Ser. No. 913,117, Jun. 6, 1978, Pat. No. 4,249,600. This application Dec. 8, 1980, Ser. No. 213,871**

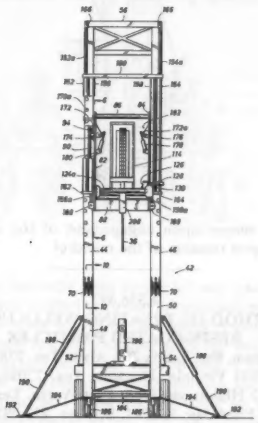
**Int. Cl.³ E21B** *15/00, 19/08, 19/22*

**U.S. Cl. 166—77** **2 Claims**

1. A suspension system for use with mast means of the type used for elevating the injector head of a well working coiled tubing apparatus, the mast means having two mast legs, comprising:

(a) first and second piston-and-cylinder assemblies with the respective first and second pistons thereof anchored, by portions of said pistons distal the corresponding piston heads thereof, at a suspension located along said mast means, and with the respective first and second cylinders thereof oriented generally mutually parallel, such that simultaneous, in-phase operation of said first and second assemblies to extend said first and second pistons effects generally simultaneous movement of said first and second cylinders generally away from said suspension location, and such operation to retract said first and second pistons effects generally simultaneous movement of said first and second cylinders generally toward said suspension location;

(b) third and fourth piston-and-cylinder assemblies with the respective third and fourth cylinders thereof oriented generally mutually parallel and generally parallel to said first and second cylinders, said third and fourth pistons of said third and fourth assemblies, respectively, being extendable along mutually parallel lines and in the same sense, but opposite to the sense in which said first and



second pistons are extendable from said first and second cylinders, respectively;

(c) wherein said first and third cylinders are mutually fixed to form a first cylinder pair, said second and fourth cylinders are mutually fixed to form a second cylinder pair, and first and second cylinder pairs are connected together by connection means, and said first and second pairs are moveable together by operation of said first and second assemblies; and

and wherein said first piston is anchored so that said first cylinder pair is moveable generally along one such mast leg, and said second piston is anchored so that said second cylinder pair is moveable generally along the other of said mast legs.

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**4,336,841**

## MECHANICAL TUBING ANCHOR

**James K. Garner, Jr., Houston, Tex., assignor to Camco, Incorporated, Houston, Tex.**

**Filed Nov. 17, 1980, Ser. No. 207,161**

**Int. Cl.³ E21B** *33/128, 33/129*

**U.S. Cl. 166—216** **8 Claims**

1. In a tubing anchor for anchoring a well tubing in an outer conduit, and in which the anchor includes slips and first and second slip cones, the improvement comprising,

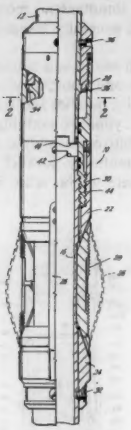
threaded means connected to at least one of the cones for moving the cones toward and away from each other for setting and releasing the slips,

a mandrel adapted to be connected to the tubing,

first and second clutch means connected to the mandrel, the first clutch means actuated by longitudinal movement of the mandrel in one direction, and the second clutch means actuated by longitudinal movement of the mandrel in a second direction,

said first and second clutch means connected to the threaded

means whereby rotation of the mandrel will set the slips upon engagement of the first clutch means and will release



the slip means upon engagement of the second clutch means upon rotation of the mandrel.

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**4,336,842**

**METHOD OF TREATING WELLS USING RESIN-COATED PARTICLES**

**John W. Graham, Rte. 5, Box 289, Alvin, Tex. 77511; A. Richard Sinclair, 2903 Virginia, Houston, Tex. 77098, and John L. Brandt, 812 Highwoods Trail, Fort Worth, Tex. 76112**

**Filed Jan. 5, 1981, Ser. No. 222,292**

**Int. Cl.[3] E21B** *43/04, 43/267*

**U.S. Cl. 166—276** **12 Claims**

1. A method of treating a subterranean formation surrounding a wellbore which comprises:

(a) placing in contact with said formation particles coated with a solid termosetting resin capable of fusing and then curing to an infusible state; and

(b) curing said resin in a solution containing an agent capable of lowering the temperature at which said resin fuses.

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**4,336,843**

**EMERGENCY WELL-CONTROL VESSEL**

**Terry D. Petty, New Orleans, La., assignor to ODECO Engineers, Inc., New Orleans, La.**

**Filed Oct. 19, 1979, Ser. No. 86,501**

**Int. Cl.[3] A62C** *3/00;* **E21B** *35/00, 43/01*

**U.S. Cl. 166—362** **10 Claims**

2. A method for controlling an erupted marine oil well which comprises:

positioning over the erupted well an emergency well-control vessel,

dispelling from the vicinity of the well-control vessel hydrocarbon vapor issuing from the well and collecting above the surface of the water,

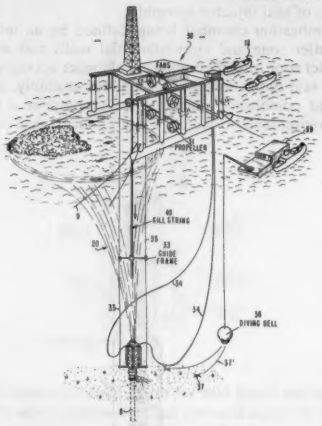
deflecting away from the well-control vessel the plume of hydrocarbon fluids emerging from the well and rising upwardly from the well to the surface of the water,

establishing a guideline connection between the well-control vessel and the wellhead equipment remaining on the sea bed, lowering a kill string from said vessel down said guideline and into the well, and

pumping a well-control fluid down the kill string into the well.

10. An emergency well-control vessel for controlling an erupted marine oil well, comprising:

a floating platform positionable above the erupted well, means for anchoring the platform in position above the erupted well, a sprinkler system mounted below said platform for extinguishing ignited hydrocarbon vapor issuing from the surface of the water below said platform, a fan system mounted below said platform for dispelling hydrocarbon vapor issuing from the water surface and collecting below said platform, a propeller system




mounted on said vessel below the water line for deflecting the plume of hydrocarbon fluids issuing from the well away from the vessel, and means mounted on said platform for lowering a kill string into the erupted well and for pumping a well-control fluid down the kill string into the well.

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**4,336,844**

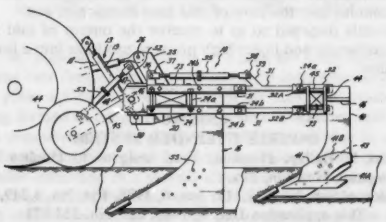
**FARM IMPLEMENT**

**William H. Helbig, and Barry F. Cornell, both of Corpus Christi, Tex., assignors to Lehman-H Feeder & Plow, Inc., Corpus Christi, Tex.**

**Continuation of Ser. No. 1,435, Jan. 8, 1979, abandoned. This application Sep. 19, 1980, Ser. No. 188,256**

**Int. Cl.[3] A01B** *13/08, 13/02*

**U.S. Cl. 172—140** **5 Claims**



1. A farm implement, comprising a frame adapted to be moved forwardly over the ground level, including a forward section having means thereon for attachment to a tractor by means of a three point hitch, a rearward section, means mounting the rearward section from the forward frame section for raising and lowering the rearward frame section with respect to the forward section and holding it in said raised or lowered position, subsoil chisels supported in laterally spaced-apart relation on the forward frame section for form longitudinally extending trenches in the ground as the frame moves forwardly thereover, gauge wheel means mounted on the forward frame section for engaging the ground level to determine the

elevation of the subsoil chisels, additional subsoil chisels each supported in laterally spaced relation on the rearward frame section so as to penetrate the soil rearward and laterally intermediate the trenches formed by the subsoil chisels supported on the forward frame section, and a plurality of listers each mounted on one of the additional subsoil chisels.

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**4,336,845**

## COMBINATION GARDEN TOOL

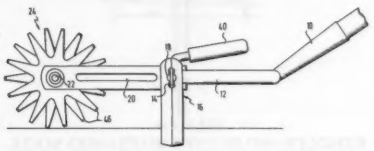
**Walter Kolb, Betzdorf, Fed. Rep. of Germany, assignor to Wolf-Geräte GmbH, Fed. Rep. of Germany**

**Filed May 12, 1980, Ser. No. 148,818**

**Claims priority, application Fed. Rep. of Germany, May 15, 1979, 7914049[U]**

**Int. Cl.³ A01B** *1/20, 1/22*

**U.S. Cl. 172—349** **12 Claims**



1. A combination garden tool, comprising:

a first tool; a handle secured to said first tool;

a second tool; and

coupling means irremovably secured to said second tool for detachably coupling said second tool to said first tool in a manner such that both said tools can be used simultaneously and further such that at least said second tool can be used alone while said tools are secured to each other; said coupling means including a yoke frame having two support arms joined by a connecting piece and having an axle secured to said support arms and disposed between them; said second tool being mounted on said axle; said first tool being disposed between said handle and said coupling means, and said coupling means being disposed between said tools, when said tools are coupled by said coupling means;

said coupling means further comprises a clamping device secured to said connecting piece; a fork frame to which said first tool is secured; said fork frame includes two fork arms for being clamped to said connecting piece by means of said clamping device; respective flat pieces secured to the ends of said fork arms for cooperating with said clamping device to clamp said fork arms to said connecting piece;

said clamping device further comprises a clamping bolt rotatable between a first and a second position, said clamping bolt clamping said flat pieces against said connecting piece when in said first position, and said flat pieces not being clamped to said connecting piece when said clamping bolt is in said second position.

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**4,336,846**

## AGRICULTURAL FOLDING TOOL BAR

**Charles Boetto, Naperville, Ill., assignor to International Harvester Co., Chicago, Ill.**

**Filed Mar. 5, 1981, Ser. No. 240,747**

**Int. Cl.³ A01B** *73/00*

**U.S. Cl. 172—776** **5 Claims**

1. A folding tool bar adapted to support ground working tools and comprising:

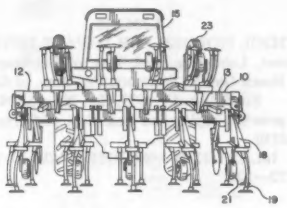
(a) a normally horizontal, hollow central section;

(b) an outer wing section pivotally connected to said central section about an offset axis for movement between a working position in general alignment with said central section and a folded transport position that lies on said central section, said pivotal connection being located above an end of said central section and adjacent thereto and providing a fulcrum for a portion of said movement;

(c) a hydraulic cylinder including a cylinder rod defining a rod end for said cylinder on the distal end thereof mounted in said inner section;

(d) a pair of rollers pivotally mounted to the rod end of said hydraulic cylinder and substantially spanning the interior of said central section; and

(e) a pair of links pivotally connected to said rod end by a shaft slidable in axially elongated slotted openings, said openings providing substantial clearance in said axial direction for said shaft said wing having an ear, said ear being pivotally connected to said links, said links upon cylinder activation, moving said wing upward until said



wing passes inwardly over center of said axis and said links move into contact with said fulcrum and pivot thereabout as the wing moves to the transport position, said rollers and said fulcrum reducing wing fall and said links slotted connection relieving roller binding in said central section in the movement between working and transport and vice versa, said wing section being so positioned relative to said central section and said slotted openings being sufficiently small that clearance of said slotted openings is taken up by said hydraulic cylinder, and said wing section is held rigidly against said central section by said hydraulic cylinder, when said hydraulic cylinder is in its retracted condition and said wing section is in said working position.

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**4,336,847**

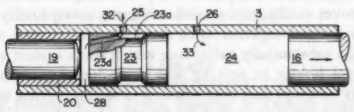
## PERCUSSION DRILL

**Koshichi Ito, and Yoshihiko Watanabe, both of Katsuta, Japan, assignors to Hitachi Koki Company, Limited, Tokyo, Japan**

**Filed Jun. 27, 1980, Ser. No. 163,504**

**Int. Cl.³ B23B** *45/04*

**U.S. Cl. 173—118** **3 Claims**



1. A percussion drill comprising:

a hollow cylinder having a hole in the side wall thereof;

a piston axially slidably disposed in the rearward end portion of said cylinder;

means for imparting an axially reciprocating movement to said piston;

a shaft axially slidably disposed in the forward end portion of said cylinder and including means for releasably attaching a drill bit to the forward end of the shaft; and

a striker including an air passage leading from the forward end wall thereof to the side wall thereof and axially slidably disposed in the cylinder between said piston and said shaft to define a forward variable volume air chamber with said shaft and a rearward variable volume air cham-

ber with said piston, a forward movement of said piston creating a positive high pressure in said rearward chamber to cause the striker to move forward to a point of impact on the rear end of said shaft and a rearward movement of said piston creating a negative pressure in said rearward chamber to cause the striker to move rearward when said drill bit is imparting mechanical energy to a workpiece;

the hole of said cylinder being located forward with respect to said impact point and communicating with said forward chamber through said air passage of the striker when the forward end of the striker is positioned forward with respect to said hole by the axial extent of said air passage.

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**4,336,848**

## TOOL HOLDER FOR IMPACT DEVICE

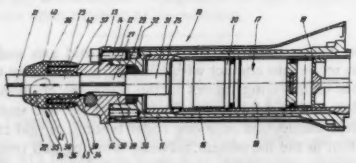
**Karl Wanner, Leinfelden, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany**

**Filed Aug. 13, 1979, Ser. No. 66,006**

**Claims priority, application Fed. Rep. of Germany, Oct. 10, 1978, 2844110**

**Int. Cl.³ B23B *5/34;* B25D *17/08, 17/11***

**U.S. Cl. 173—139** **30 Claims**



1. A hand-held power tool, particularly a chipping hammer, comprising a tool holder having an axis, and a receiving recess comprising an annular section arranged for non-rotatably and axially movably receiving a shaft of a tool and having an inlet opening, so that a portion of the tool extends outwardly beyond said tool holder in direction toward a workpiece, said tool holder having a front axial end face at one end which is opposite to the shaft receiving end, and a front axial end portion adjacent to said front axial end face; a striking mechanism arranged to transmit impact energy and to impart reciprocating movement to the tool; and an impact damping arrangement arranged for damping of axial impacts of the tool against the power tool, said arrangement including a shaped member which is constituted of a substantially elastic material and firmly and axially immovably held only on the tool without being held on another part of the power tool, so that when the tool moves axially, said shaped member is unimpededly moved axially by and together with the tool, said shaped member having a substantially radial face which abuts against a face of said tool holder in striking and noise-damping manner and radially overlaps said inlet opening of said receiving recess so as to serve simultaneously for protection from dust, said face of said tool holder being located at said tool holder side and facing in said direction toward a workpiece and being accessible for and in direct contact with said radial face of said shaped member at said side, said shaped member having a cylindrical bush which is received in said annular section of said receiving recess and reciprocates together with the tool without being completely axially withdrawn from said annular section and so as to provide axial impact damping between the tool and the tool holder, damping of noise and protection from dust, said shaped member also having an outer sleeve which surrounds said cylindrical bush at a radial distance therefrom and coaxially therewith, said outer sleeve overlapping said front axial end portion of said tool holder in a substantially cup-like manner so as to serve for protection from dust and damping noise.

**4,336,849**

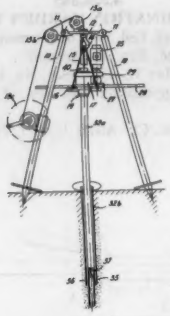
## EARTH DRILLING DEVICE FOR EXTRACTING EARTH SAMPLES

**Max Hug, Sagenmattstrasse 11, CH-6003 Luzern, Switzerland**

**Filed Jul. 3, 1980, Ser. No. 165,667**

**Int. Cl.³ E21B *49/02***

**U.S. Cl. 175—246** **6 Claims**



1. An earth drilling device for extracting earth core samples including,

a rotatable drill tube and means for rotating said drill tube;

a drill bit supported by said rotatable drill tube, said drill bit and said drill tube defining an inner shoulder;

a hollow probe movably disposed within said drill tube and adapted to be supported by said inner shoulder;

an exchangeable thin plastic sleeve of uniform thickness disposed within said hollow probe, said sleeve containing a multiplicity of axis parallel pre-folds uniformly distributed along its circumference, and exhibiting a polygonal cross section which conforms to the circular inner circumference of said hollow probe to form a smooth, cylindrical receiving surface for said earth core samples when inserted in said hollow probe; and

means for extracting said hollow probe and associated plastic sleeve containing an earth core sample without removing the drill tube from the earth.

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**4,336,850**

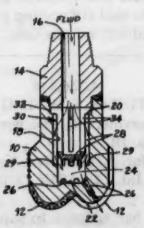
## INTERNAL FLUID SCREEN TO PREVENT NOZZLE AND PORT PLUGGING

**Coy M. Fielder, Granger, Utah, assignor to Christensen, Inc., Salt Lake City, Utah**

**Filed Sep. 12, 1980, Ser. No. 186,774**

**Int. Cl.³ E21B *10/60***

**U.S. Cl. 175—393** **7 Claims**




1. A strainer for use with a rotary drill bit for deep holes in shales, sandstone, conglomerate, coal and the like wherein the tool is mounted to be rotatably driven at the downhole end of a drill string through which a fluid is circulated, comprising a body having an outerface, said body having an internal cavity to receive the fluid, said cavity being defined by a side wall,

said cavity having an end wall with restricted flow passages leading from said cavity to the outer face of the body through which said fluid flows, said sidewall of said cavity having a plurality of slots formed therin, a screen element in the form of a hollow cage having side and bottom walls shaped to fit within said cavity to be closely fitted to said side wall of the cavity with its bottom wall spaced from said end wall of the cavity, said screen having a plurality of elongated narow passages cooperating with said slots adapted to strain fluid cut through its sidewall, and means to hold said screen in said cavity with its passages aligned with said slots in the side wall of the cavity whereby drilling fluid may flow to said tool to be screened in said tool body through said slots and passages before it passes to said restricted flow passages.

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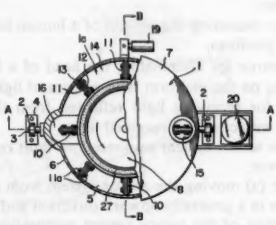
4,336,851

## LOOP CONVEYOR TYPE FLOW WEIGHER

Hiroyuki Iwako, Tokyo, Japan, assignor to Funken Co., Ltd., Japan

Filed Aug. 13, 1980, Ser. No. 178,016
Claims priority, application Japan, Aug. 14, 1979, 54/102834
Int. Cl.[3] G01G *11/06*
U.S. Cl. 177—16 5 Claims



1. A loop conveyor type flow weigher comprising a loop conveyor having:

a circular loop path for carrying powder material,

means for balancing said loop conveyor at two points on the loop diameter, whereby said loop conveyor is pivotable about said loop diameter at said two points, and

a load detector which is disposed orthogonally to said loop diameter and on which the loop conveyor rests,

said loop conveyor having a material receiving port provided at one end of said loop diameter in proximity to one of said two points of said means for balancing, and a material discharge port provided diametrically opposite said material receiving port in proximity to other of said two points of said means for balancing,

driven rotary means for carrying powder material which is fed to said material receiving port and is continuously carried to said material discharge port,

means for counting the number of rotations of said rotary means, and

wherein the total weight of said material carried in a semicircle from said material receiving port to said material discharge port along said loop path is calculated by multiplying the weight carried through such semicircle by said rotary means as determined by said load detector, by the total number of revolutions of said rotary means as counted by said counting means.

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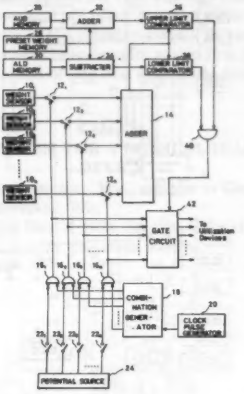
4,336,852

## COMBINATION WEIGHING DEVICE

Takashi Hirano, Kobe, Japan, assignor to Yamato Scale Company, Ltd., Hyogo, Japan

Filed Dec. 12, 1980, Ser. No. 215,819
Claims priority, application Japan, Dec. 24, 1979, 54-168816
Int. Cl.[3] G01G *19/04;* B07C *5/16*
U.S. Cl. 177—25 2 Claims



1. A combination weighing device comprising a plurality of weighing balances for measuring weights of a plurality of articles each to produce weight signals representative of said weights, an arithmetic unit having a plurality of inputs for summing up said weight signals received therein and comparing the resultant sum with a predetermined range of weight to produce an output when said sum is within said range, a plurality of normally-open switches each having a control terminal and coupled respectively between said weighing balances and said outputs of said arithmetic unit, switch control means having a plurality of outputs coupled respectively to said control terminals of said normally-open switches for providing control signals successively from the outputs selected in accordance with a predetermined set of combinations, and means for supplying the control signals from said switch control means to utilization devices in response to said output of said arithmetic unit, wherein said device further comprises means for inhibiting selectively application of said weight signal from any weighing balance to said arithmetic unit and application of said control signal from the corresponding output of said switch control means to said utilization device, thereby permitting interruption of operation of the corresponding weighing balance without interrupting the device operation.

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4,336,853

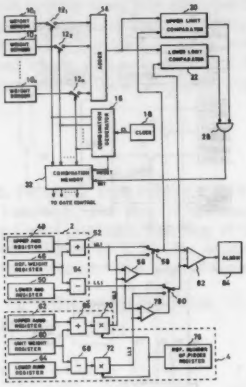
## COMBINATION WEIGHING DEVICE

Takashi Hirano, Kobe, Japan, assignor to Yamato Scale Company, Ltd., Hyogo, Japan

Filed Dec. 22, 1980, Ser. No. 218,850
Claims priority, application Japan, Dec. 24, 1979, 54-168818
Int. Cl.[3] G01G *19/04;* B07C *5/16*
U.S. Cl. 177—25 4 Claims

1. A combination weighing device, comprising a plurality of weighing balances for weighing a plurality of articles each to produce corresponding weight signals, respectively, an adder circuit for summing up incoming signals to produce a sum signal, means for coupling said weight signals to said adder circuit through individual normally-open switches each having a control input, means coupled to said control inputs for closing said switches selectively in accordance with a predetermined set of combinations thereof, first means for providing predetermined first upper and lower limits of an allowable

range of the total weight of articles, means for comparing said sum signal with an incoming allowable range to produce a command signal when the sum falls within said range, and means responsive to said command signal for storing a current combination for utilization, second means for providing predetermined second upper and lower limits of an allowable range of the unit weight of said articles, means for providing a predetermined total number of articles, multiplier means for multiplying said second upper and lower limits by said total number to produce third upper and lower limits, respectively, means for comparing said first and third upper and lower limits with each other and applying the severe ones of said upper and lower limits to said command signal producing and comparing means as the upper and lower limits of said allowable range.



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**4,336,854**

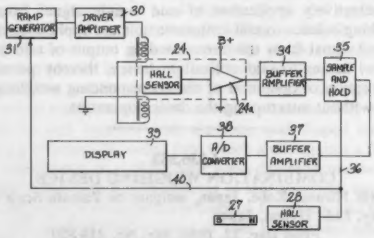
**WEIGHING SYSTEM**

**William F. Jensen, 7 Iroquois Dr., Clinton, Conn. 06413**

**Continuation-in-part of Ser. No. 54,838, Jul. 5, 1979, abandoned. This application Oct. 29, 1980, Ser. No. 201,712**

**Int. Cl.³ G01G *7/02***

**U.S. Cl. 177—210 R** **10 Claims**




1. In a weighing system of the type where an electromagnet is excited to move a load bearing member toward a null position, the improvement comprising: means for exciting the electromagnet at a finitely increasing rate to produce a magnetic field acting to move said load bearing member, means for sensing when said load bearing member moves under the force of the magnetic field, means for measuring the strength of the magnetic field of said electromagnet and generating a signal indicative thereof, means responsive to said sensing means for sampling the generated signal, and means responsive to said sampling means for indicating the weight of a load on said load bearing means.

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**4,336,855**

**AUTOMATIC DIGIT DISPLAY MACHINE FOR MEASURING HEIGHT AND WEIGHT**

**Li-Fu Chen, 2nd Fl., No. 2, Alley 5, La. 57, Fu-Ho Rd., Yuan-Ho City, Taiwan**

**Filed May 28, 1980, Ser. No. 154,038**

**Int. Cl.³ G01G *23/00***

**U.S. Cl. 177—245** **9 Claims**

1. An apparatus for measuring and displaying the height and weight of a human being, comprising:

a platform;

means for measuring the weight of a human being standing on the platform;

a light source for illuminating the head of a human being standing on the platform with a beam of light;

a mirror for receiving light reflected from the head and further reflecting the received light;

a movable sensor system responsive to light reflected from the mirror;

means for (a) moving the sensor system from a first lower position in a generally upward direction and (b) stopping the motion of the sensor system responsive to light reflected thereto from the mirror;

means for determining the position of the stopped sensor system and interpreting this position as a corresponding height of the human being on the platform; and

means for simultaneously displaying the measured weight and height.

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**4,336,856**

**TURBO-FLYWHEEL-POWERED VEHICLE**

**Joseph A. Gamell, Kalamazoo, Mich., assignor to Joseph Gamell Industries, Inc., Kalamazoo, Mich.**

**Filed Aug. 27, 1979, Ser. No. 69,826**

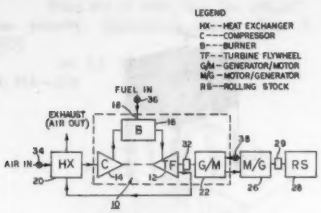
**Int. Cl.³ B60K *5/06*; F02C *7/10***

**U.S. Cl. 180—165** **4 Claims**

3. A turbo-flywheel-powered vehicle comprising:

a drag turbine having an inner rotor which has a mass distribution such that it functions efficienty as a flywheel and an outer stator having a smooth right cylindrical inner surface opposed to a roughened right cylindrical outer surface on said rotor, a plurality of jet orifices in said stator oriented to jet a portion of propellant fluid into the space between the apposed surfaces and another portion onto the roughened surface of said rotor, and venting means adapted to vent spent propellant fluid laterally between said orifices; means for producing hot propellant fluid under pressure comprising an air compressor; and means for translating rotation of said rotor into motion of said

vehicle; said compressor and said turbine being juxtaposed and having a channel therebetween through which spent




propellant is exhausted, whereby said compressor is in heat exchange with spent propellant.

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**4,336,857**

## VEHICLE SPEED-CONTROL SYSTEM AND ACTUATOR DEVICE

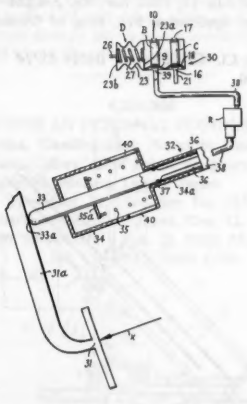
**Norman Hunt, Leamington Spa, England, assignor to Associated Engineering Limited, Warwickshire, England**

**Continuation-in-part of Ser. No. 902,592, May 4, 1978, Pat. No. 4,218,997. This application Apr. 2, 1980, Ser. No. 136,596**

**Claims priority, application United Kingdom, Apr. 7, 1979, 7911813; Oct. 9, 1979, 7935012**

**Int. Cl.³ B60K *31/00***

**U.S. Cl. 180—177** **3 Claims**



**1**. A motor vehicle speed-control system for maintaining the vehicle speed substantially constant, comprising an electronic control circuit operable to sense the speed of the vehicle and produce a pulsed output of which the mark-to-space ratio of the pulses varies in dependence upon a comparison between the actual vehicle speed and a selected vehicle speed, an engine speed control adjustable by an actuator device including a chamber having a movable wall connected to said engine speed control, the chamber wall being movable by changing the pressure of the gas in the chamber under control of two electromagnetic valves, the first electromagnetic valve being energized by said electrical pulses to connect the chamber to first and second sources of gas pressure in accordance with the mark-to-space ratio of the pulses, and the second electromagnetic valve being spring biassed so that, when de-energized, its valve moves to a first position in which it opens a connection between the chamber and said first pressure source and, when energized, the valve moves to a second position in which it closes said connection, the actuator device adjusting the engine speed-control to reduce the engine speed as the gas pressure in the chamber approaches said first pressure, characterized by an auxiliary dump valve which is normally closed and is opened by actuation of the vehicle brake pedal or other driver-actuable member to connect said first pressure source to said chamber through a further connection which is closed by said second electromagnetic valve when in its said first position and is opened when said second electromagnetic valve is in its said second position, the gas flow between the chamber and said first pressure source, when both the auxiliary dump valve and said further connection are open, being at a rate sufficient to cause the pressure in the chamber rapidly to approximate to and to be maintained approximately at said first pressure irrespective of the action of said first electromagnetic valve.

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**4,336,858**

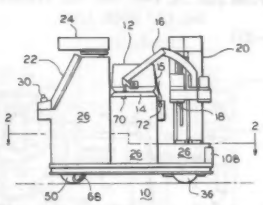
## BRAKING SYSTEM FOR A MEDICAL DIAGNOSTIC DEVICE

**Robert J. Loyzim, Dousman, Wis., assignor to General Electric Company, Milwaukee, Wis.**

**Filed Nov. 3, 1978, Ser. No. 957,533**

**Int. Cl.³ B60K *31/00***

**U.S. Cl. 180—179** **7 Claims**



**1**. An automatic electrical brake system for a mobile medical diagnostic device having a self-propelling motor means and a supporting wheel assembly and a hand operable throttle control, said system comprising:

an electromechanical brake operatively associated with the wheel assembly, said brake being engagable proportionally in response to electrical current applied thereto,

means for sensing the velocity of the device and producing a present velocity signal,

means for sensing the position of the throttle control and producing a throttle command signal,

circuitry means for comparing the present velocity signal to the throttle command signal and, when the velocity signal is greater than the throttle command signal, applying current to said brake proportionally to the difference in the signals,

a motor brake operatively associated with the self-propelling motor means, and

circuitry means for comparing the present velocity signal to the throttle command signal and, whenever the velocity signal is a preselected amount greater than the throttle command signal, applying current to said motor brake.

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**4,336,859**

## CARDAN DRIVE FOR MOTORCYCLES

**Horst Leitner, Dr.-Th.-Körner-Strabe 33, in Bruck a.d. Mur, Steiermark, Austria**

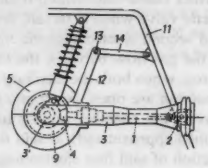
**Filed Apr. 4, 1980, Ser. No. 137,152**

**Int. Cl.³ B62M *17/00***

**U.S. Cl. 180—226** **8 Claims**

**1**. In a Cardan drive for a motorcycle rear wheel supported by a swing arm pivoted to a frame and a housing is supported pivotally with respect to the swing arm and is connected via a guide member on the frame by means of a control arm, the latter being rigidly connected to the housing, and within the housing a pinion connected with a Cardan shaft is supported

and a ring gear engaging with the pinion connected with the rear wheel is contained, the improvement wherein



said guide member is pivoted to a point on the frame disposed above the swing arm.

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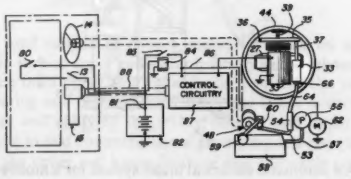
**4,336,860**

## MATERIAL HANDLING VEHICLE HAVING IMPROVED DEADMAN CONTROL

**Fred W. Noller, Muscatine, and James C. Kramer, Davenport, both of Iowa, assignors to The Prime-Mover Co., Muscatine, Iowa**

**Filed Jan. 24, 1980, Ser. No. 115,055**
**Int. Cl.³ B60K *1/00***
**U.S. Cl. 180—273** **10 Claims**




1. In a material handling vehicle including a main frame structure, wheel means supporting said main frame structure, brake means associated with said wheel means, spring means for operating said brake means to an engaged condition, an electrically controlled system on said main frame structure including motive power means for supplying motive power to said wheel means for driving said vehicle, an operator's platform supported on said main frame structure, and a deadman switch on said platform for controlling energization of said electrically controlled system, said deadman switch being operable to an open position with no operator on said operator's platform to prevent energization of said electrically connected system and supply of motive power to said wheel means and being operable to a closed position by an operator on said operator's platform to allow energization of said electrically controlled system and supply of motive power to said wheel means, and brake release means responsive to energization of said electrically controlled system for operating against said spring means to operate said brake means to a released position.

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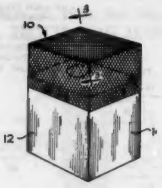
**4,336,861**

## SPEAKER SYSTEM

**B. Keith Peter, 1200 Valley Rd., Deerfield, Ill. 60015**

**Filed Aug. 23, 1972, Ser. No. 283,069**
**The portion of the term of this patent subsequent to Nov. 29, 1994, has been disclaimed.**
**Int. Cl.³ H04R *7/00*; H05K *5/00***
**U.S. Cl. 181—144** **5 Claims**

1. An omnidirectional loudspeaker system comprising an enclosure having sound impermeable walls defining a path for the transmission of sound, said enclosure having a first wall at one end of the path provided with a first opening therein, said enclosure having a second wall at the other end of the path with a second opening therein, a speaker mounted on the first wall of the enclosure, said speaker having a cone shaped diaphragm acoustically sealed at its periphery about the first opening, said speaker having natural free air resonance produc-



ing sound waves having a wavelength twelve times the length of the path from the first opening to the second opening, and a mass of sound absorbing material disposed within and extending across the path.

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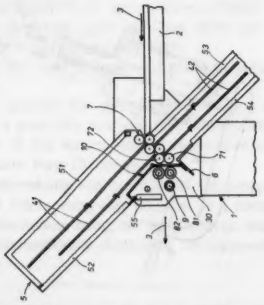
**4,336,862**

## DEVICE FOR REDUCING THE EMISSION OF NOISE IN BUCKLE FOLDING MACHINES

**Axel Adam, Backnang-Steinbach, and Fritz Heina, Murrhardt, both of Fed. Rep. of Germany, assignors to Maschinenbau Oppenweiler Binder GmbH & Co., Oppenweiler, Fed. Rep. of Germany**

**Filed Jun. 16, 1981, Ser. No. 274,254**
**Claims priority, application Fed. Rep. of Germany, Jul. 3, 1980, 3025239**
**Int. Cl.³ G10K *11/00*; B65H *45/14***
**U.S. Cl. 181—200** **3 Claims**



1. A device for reducing the emission of noise in buckle folding units provided with noise control enclosures, comprising a noise control hood essentially completely enclosing the upper and lower folding pockets and the folding rolls, said noise control hood being at least partially slidingly displaceable, tiltable and/or removable and being provided with a slot for the passage of the sheet in the associated hood section, which slot is aligned with the nip of the pair of intake and discharge rolls, respectively, characterized in that the hood section associated with the pair of discharge rolls (**71, 72**) comprises a cover plate (**10**) having a vertical first section (**12**) secured to the hood and a second section (**11**) held on the first section (**12**) pivotably between an inclined closed position adjoining to the hood and an opened position above the folding rolls (**7**), wherein the longitudinal edges, being parallel to the roll axes, of the discharge slot (**15**) provided in the vertical section (**12**) are arranged such as to form noise emission sealing sites in cooperation with the peripheral surfaces of the pair of discharge rolls (**71, 72**).

4,336,863

## SILENCER IN GAS FLOW PASSAGE

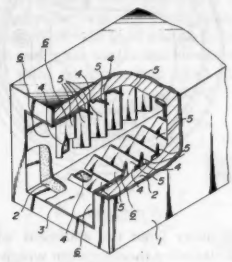
Seigo Satomi, Nagoya, Japan, assignor to NGK Insulators, Ltd., Nagoya, Japan

Filed Jul. 6, 1981, Ser. No. 280,217

Claims priority, application Japan, Dec. 5, 1980, 55-175358[U]

Int. Cl.³ E04F 17/04; F01N 1/10

U.S. Cl. 181—224 5 Claims



1. A silencer including a sound absorbing material forming walls of gas flow passages in a duct casing, said silencer comprising guard plates for covering surfaces of said sound absorbing material facing said gas flow passages, each said guard plate being formed with a number of sound absorbing apertures and provided at edges of said sound absorbing apertures with oblique plates continuous with said edges and bent inclined to a surface of said guard plate such that gas flow is prevented from directly entering said sound absorbing material through said sound absorbing apertures.

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4,336,864

## SILENCER FOR AN INTERNAL COMBUSTION ENGINE

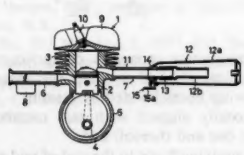
Urataro Asaka, Kamifukuoka; Naomoto Uesugi, Tokyo, and Nobuo Anno, Urawa, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 11, 1980, Ser. No. 215,436

Claims priority, application Japan, Dec. 13, 1979, 54-160856; Feb. 14, 1980, 55-16475[U]; Feb. 15, 1980, 55-17154[U]

Int. Cl.³ F01N 7/00, 1/08

U.S. Cl. 181—241 5 Claims



1. A silencer for an internal combustion engine comprising:

a tubular main silencer having inlet means at one of its axial ends for connection to an exhaust pipe of said engine, an outlet at the other axial end thereof for the exhaust of combustion gases from said engine, a progressively increasing diameter from the inlet means end to the outlet end for accommodating and silencing the exhaust of gases from said engine when said engine is operating in a high speed range, and an annular conical seat interiorly defined at the inlet end;

a tubular secondary silencer entirely positioned interiorly within the main silencer and fixedly supported therein, the secondary silencer having an inlet end and, a substantially constant diameter throughout its length for accommodating and silencing the exhaust of gases from said engine in conjunction said main silencer when said engine is operating in a low speed range;

a tubular member slidably supported within a tubular portion of the inlet end of the secondary silencer and axially movable between a first position in which it receives the entire flow of gases from said engine and directs them totally into the secondary silencer and a second position in which said exhaust gases can pass direct by into said main silencer, said tubular element including an annular conical portion at its end adjacent said inlet means of said main silencer which is sealingly received in said conical seat when said tubular member is in said first position; and

means for moving said tubular member between said first and second positions to change the exhaust characteristics of said silencer.

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4,336,865

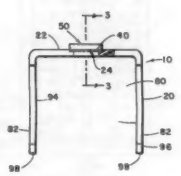
## CARTRIDGE CASE LUBRICATOR

Eugene T. Carkoski, 7560 Parker St., Omaha, Nebr. 68114

Filed Nov. 17, 1980, Ser. No. 207,381

Int. Cl.³ F42B 31/00; F16N 3/00

U.S. Cl. 184—14 6 Claims



1. A cartridge case lubricator comprising a frame having lowermost portions on a substantially horizontal plane for support by a horizontal surface, an upper frame portion having a hole extending vertically therethrough, a recess means extending partially through said upper frame portion from its upper side, said recess means overlapping said hole, said recess means providing upwardly facing shoulder means on sides of said hole, a support extending across said hole and lapping said shoulder means, said shoulder means being of adequate size and position and said support lapping said shoulder means sufficiently that said support is itself supported by said shoulder means against substantial downward pressure on said support, an oil absorbent means disposed above and supported by said support, said oil absorbent means having an opening extending vertically therethrough, the area of said opening being of much lesser size as seen from the top thereof than the area of said hole as said hole is seen from the bottom of the frame, said support being provided with a passage therethrough disposed in at least partial registry with said opening in said absorbent means, said opening and said passage and said hole all being of large enough size so that at least one size of cartridge from the cartridge size range of 0.17 to 0.45 calibre can be effectively lubricated by passing said cartridge therethrough, said frame having a large open space therein beneath said hole whereby a cartridge case can be passed through said opening and said passage and said hole and grapsed by an operator's hand in said space for removal from said lubricator.

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4,336,866

## WIRE ROPE LUBRICATOR CLEANER

Kistler J. Blanton, Jr., 628 S. Laurel St., Summerville, S.C. 29483

Filed Jan. 24, 1980, Ser. No. 114,783

Int. Cl.³ B05B 1/04; F16N 7/14, 9/00

U.S. Cl. 184—15 R 11 Claims

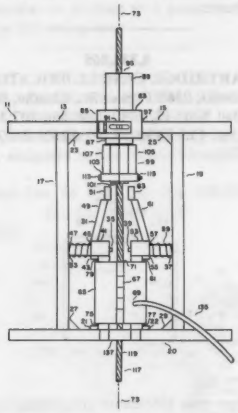
1. A wire rope lubricator comprising in combination:

a rectangular shaped frame having a pair of substantially parallel bracing bars, an upper rack handle assembly at-

tached to said pair of bracing bars at one end thereof, and a lower rack handle assembly attached to said pair of bracing bars at the opposite end thereof;

a lower slide assembly affixed to the pair of parallel bracing bars of said rectangular shaped frame;

lubricating means removably coupled to said rectangular shaped frame between said lower rack handle assembly and said lower slide assembly such that said lubricating means may be removed from said rectangular shaped frame, said lubricating means having an intake port, and an aperture for passing therethrough a wire cable so as to allow a lubricant cleaner to be applied to said wire cable; said wire cable having therein a plurality of spiral strands;



an upper slide assembly mounted around said upper rack handle assembly in slidable engagement therewith, said upper slide assembly having an aperture for passing therethrough said wire cable; and

reconditioning means rotatably supported by said upper slide assembly, said reconditioning means having a plurality of internal spiral grooves, the internal spiral grooves of said reconditioning means fitting the spiral strands of said wire cable so as to allow said wire cable to pass through said reconditioning means, said reconditioning means being adapted for cleaning said wire cable, and for removing the excess lubricant from said wire cable.

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**4,336,867**

**DRUM BRAKE HAVING DUO MODE**

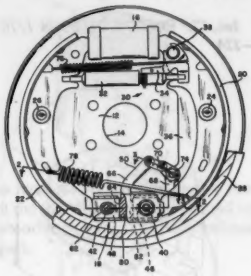
**Ji Y. Woo, South Bend, Ind., assignor to The Bendix Corporation, Southfield, Mich.**

**Filed Oct. 1, 1979, Ser. No. 80,809**

**Int. Cl.³ F16D *51/20, 51/50***

**U.S. Cl. 188—326** **5 Claims**

1. In a drum brake assembly having a hydraulic actuator which cooperates with a pair of brake shoes to radially expand the latter from a rest position to a braking position during a service brake application, a backing plate for carrying the hydraulic actuator and the pair of brake shoes, a parking assembly cooperating with the pair of brake shoes to radially expand the latter from a rest position to a braking position during a parking brake application, said parking assembly including a strut extending between the pair of brake shoes substantially adjacent to said hydraulic actuator and said parking assembly also including an arm pivotal relative to one of the pair of brake shoes and engaged with said strut, and a support assembly engageable with said pair of brake shoes to absorb braking torque developed by said pair of brake shoes, said support assembly including a pair of blocks engageable, respectively, with said pair of brake shoes and also abutting said backing plate to transfer torque thereto during a service brake application, said support assembly further including a lever responsive to actuation of said parking assembly and cooperating with said pair of blocks to further expand the latter when said parking assembly is actuated, said pair of



blocks moving away from the abutment with said backing plate to form a clearance therebetween which permits said pair of blocks and said pair of brake shoes to move slightly with the drum relative to the backing plate when said parking assembly is actuated.

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**4,336,868**

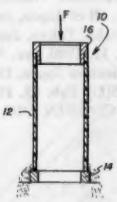
**COMPOSITE FIBROUS TUBE ENERGY ABSORBER**

**Henry E. Wilson; James D. Cronkhite, both of Hurst, and John V. Howard, Arlington, all of Tex., assignors to Textron, Inc., Providence, R.I.**

**Continuation-in-part of Ser. No. 904,381, May 10, 1978, abandoned. This application Nov. 7, 1979, Ser. No. 91,880**

**Int. Cl.³ F16F *7/12***

**U.S. Cl. 188—376** **53 Claims**



1. Force attenuation apparatus, comprising:

an elongate member of a composite material comprising load-bearing fibers bonded by a resin;

an anvil axially aligned with said member and disposed adjacent one end thereof; and

means for applying force to the end of said elongate member opposite said anvil to progressively disintegrate said member at the face of said anvil.

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**4,336,869**

**STEERING CLUTCH AND BRAKE CONTROL FOR TRACK-TYPE VEHICLES**

**Yoshio Tsutsumi, Hirakata, Japan, assignor to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan**

**Filed Jun. 24, 1980, Ser. No. 162,438**

**Claims priority, application Japan, Jun. 29, 1979, 54-81440**

**Int. Cl.³ F16D *67/04***

**U.S. Cl. 192—13 R** **3 Claims**

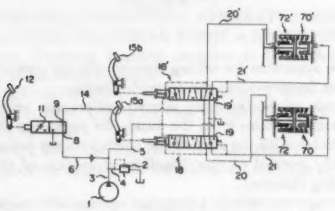
1. A steering clutch and brake control system for a track-type vehicle in which driving force is applied to both sides thereof, comprising in combination:

a source of pressurized fluid;

a pair of clutch means each associated with one side of the vehicle and disengageable to disconnect the driving force applied to that side of the vehicle upon application of fluid pressure thereto;

a pair of brake means each associated with one side of the vehicle and normally disengaged by fluid pressure applied thereto and engageable upon blocking fluid pressure therefrom;

a pair of first valve means each associated with one side of the vehicle and said fluid pressure source and including a reciprocable valve spool positionable in a first position blocking fluid pressure from said clutch means but allowing fluid pressure from said fluid source through said first valve means to said brake means and movable sequentially to second and third positions, said spool in said second



position allowing fluid pressure from said fluid source through said first valve means not only to said brake means but also to said clutch means to disengage said clutch means, said spool in said third position allowing fluid pressure from said fluid source through said first valve means to said clutch means to maintain said clutch means in its disengaged state but blocking fluid pressure from said brake means thereby actuating said brake means; and

second valve means connected with said fluid source and said first valve means, said second valve means having formed therein a neutral communication position and an offset position where fluid in said brake means is drained through said second valve means to a tank thereby engaging said brake means whether said clutch means is engaged or disengaged.

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**4,336,870**

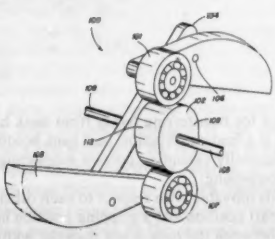
## TORQUE EXCHANGE COUPLING

**Robert H. Shea, Bergen, N.Y., assignor to Shea Inventive Designs, Rochester, N.Y.**

**Division of Ser. No. 757,249, Jan. 6, 1977, Pat. No. 4,195,721, which is a continuation-in-part of Ser. No. 652,206, Jan. 26, 1976. This application Nov. 26, 1979, Ser. No. 97,393**

**Int. Cl.³ F16D *43/18*; F16H *33/02***

**U.S. Cl. 192—105 CF** **1 Claim**



1. A coupling for transmitting rotational mechanical power comprising:

(a) a cam having an exterior peripheral surface;

(b) a circuitous track situated on said exterior peripheral surface of the cam, the linear course of said track being undulant in relation to its axis of rotation;

(c) a rotatable power input shaft;

(d) a rotor in communication with the power input shaft such that the rotation of the input shaft causes the rotation of said rotor; and,

(e) associated with said rotor, means for conveying rotational mechanical power from the input shaft to the undulant track comprising a variably extendible member being capable of making contact with the undulant track at any point in its linear course as a result of centrifugal force causing the extention of said variably extendible member.

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**4,336,871**

## CLUTCH MECHANISM

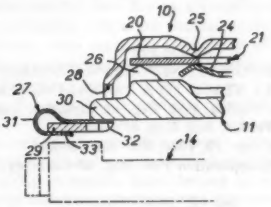
**Rene Billet, Lamorlaye, France, assignor to Societe Anonyme Francaise du Ferodo, Paris, France**

**Filed Jun. 5, 1979, Ser. No. 45,649**

**Claims priority, application France, Jun. 9, 1978, 78 17286**

**Int. Cl.³ F16D *13/71***

**U.S. Cl. 192—107 C** **9 Claims**



1. A clutch cover assembly comprising a cover having a generally cylindrical skirt and a radially extending peripheral mounting flange with at least one plane area, a pressure plate mounted in said cover for axial displacement of said pressure plate relative to said cover, axially acting resilient means operatively disposed between said cover and said pressure plate and urging said pressure plate away from and out of said cover, and in an inoperative storage state of said clutch cover assembly at least one retaining shim positively defining and axially maintaining the position of said pressure plate within said cover and relative to said cover against the force of said resilient means, a passage through said skirt of said cover in line with said plane area on said flange, said retaining shim being of generally U-shaped hairpin configuration and being radially inwardly inserted through said passage and resiliently clamped in place on opposed sides of said flange, said shim having a leg adjacent to and facing said cover flange, said leg being disposed axially between the face of said pressure plate facing away from said axially acting resilient means and said cover flange.

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**4,336,872**

## APPARATUS FOR TRANSFERRING PARTS OR THE LIKE

**Teruyoshi Noda; Iwao Ichikawa, and Toshio Takahashi, all of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan**

**Filed May 1, 1980, Ser. No. 145,720**

**Claims priority, application Japan, May 10, 1979, 54-57446**

**Int. Cl.³ B65G *11/00***

**U.S. Cl. 193—2 R** **1 Claim**

1. An apparatus for transferring cylindrical parts from a first location to a second location, comprising:

a transferring tube of triangular cross-section having first and second ends;

means at said first location for feeding said cylindrical parts into said first end; and

means at said second location for receiving said cylindrical

parts from said second end, including a connecting pipe having a large diameter portion of circular cross-section

receiving said second end of the transferring tube and deforming said second end into a circular cross-section.

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**4,336,873**

## APPARATUS FOR TRANSPORTING CIGARETTES FROM A SUPPLY STACK TO A PACKAGING MACHINE

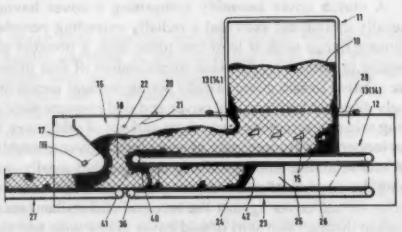
**Heinz H. Focke, Verden, Fed. Rep. of Germany, assignor to Focke & Co., Verden, Fed. Rep. of Germany**

**Filed Jun. 19, 1980, Ser. No. 160,894**

**Claims priority, application Fed. Rep. of Germany, Jul. 21, 1979, 2929660**

**Int. Cl.³ B65G *1/00***

**U.S. Cl. 198—347** **9 Claims**



9. An apparatus for transporting cigarettes from a supply stack (**11**) to a packing machine, and including an intermediate conveyor (**12**) extending horizontally below the stack, a horizontal transfer conveyor (**27**) for transporting the cigarettes to the packing machine and a buffer storage magazine disposed before the transfer conveyor in the direction of cigarette flow to receive and discharge cigarettes depending on periodic fluctuation in their supply to thus maintain a constant output, characterized by:

(a) the magazine (**23**) comprising a belt (**24**) having an end wall (**25**) mounted on it and being movable back and forth,

(b) the magazine being disposed below the intermediate conveyor in a plane parallel thereto,

(c) the transfer conveyor being disposed in the plane of the magazine belt and comprising a horizontal extension thereof,

(d) edge slots (**37, 38**) formed on opposite sides of the intermediate conveyor, limited by sidewalls (**13, 14**) thereof, and extending in the longitudinal direction of the intermediate conveyor, and

(e) a diverter plate (**39**) mounted below said slots at a descending angle to discharge misaligned cigarettes falling through the slots.

**4,336,874**

## SETTING MACHINE FOR SPACING FORMED ARTICLES

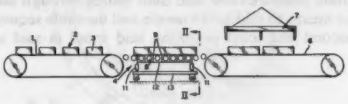
**Hermann Kamphues, Ibbenbueren, Fed. Rep. of Germany, assignor to C. Keller GmbH & Co., KG, Maschinenfabrik, Ibbenbüren-Laggenbeck, Fed. Rep. of Germany**

**Filed May 1, 1980, Ser. No. 145,446**

**Claims priority, application Fed. Rep. of Germany, Sep. 22, 1979, 2938403**

**Int. Cl.³ B65G *47/26***

**U.S. Cl. 198—458** **13 Claims**



1. An apparatus for setting formed articles comprising means for providing the formed articles;

a series of horizontally spaced rollers for receiving the formed articles from the means for providing the formed articles with the axes of the spaced rollers being substantially normal to the direction of motion of the articles being received;

a carriage movable in a direction substantially parallel to the axis of the spaced rollers;

at least two actuators mounted on the carriage and independently operable;

at least two support strips each extending in a direction substantially parallel to the roller axes and subdivided into sections connected to the actuators said sections being capable of moving up and down independently from each other between the rollers; and means for receiving the formed articles.

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**4,336,875**

## APPARATUS FOR THE TRANSFER OF HANKS

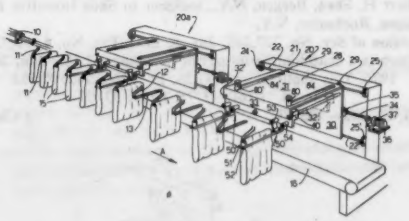
**Federico Minnetti, Pieve a Nievole, Italy, assignor to Officine Minnetti di Ornella Reveggi & C. S.A.S., Colonna, Italy**

**Filed May 28, 1980, Ser. No. 154,030**

**Claims priority, application Italy, Jun. 1, 1979, 23219 A/79; Jul. 23, 1979, 24561 A/79**

**Int. Cl.³ B65G *25/04***

**U.S. Cl. 198—486** **21 Claims**



20. A device for transferring hanks from hank holding supports moving in a feeding direction, said hank holding supports having a horizontally extending portion supporting the hanks, said device comprising:

a pair of rods movable with respect to each other between a spaced apart position and a gripping position in which the distance between the rods is less than the width of a hank carried by one of said hank holding supports;

means for controlling movement of said rods between said spaced apart position and said gripping position;

head means for supporting said rods and said means for controlling movement of said rods; and

first movement means for moving said head means to and fro in a first direction parallel to an extension of said horizontally extending portion of said hank holding supports so that said rods in said spaced apart position are located on opposite sides of a hank supported on one of said hank holding supports and so that said rods after being moved to said gripping position are moved away from the hank holding support to thereby transfer the hank.

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4,336,876

## MECHANICAL HANDLING APPARATUS FOR RECLAIMING MATERIAL FROM A STOCKPILE

Eric R. Cox, Twyning, England, assignor to Babcock-Moxey Limited, Gloucester, England

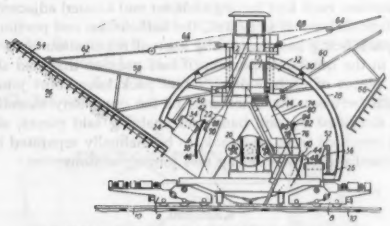
PCT No. PCT/GB79/00127, § 371 Date Apr. 8, 1980, § 102(e) Date Apr. 3, 1980, PCT Pub. No. WO80/00333, PCT Pub. Date Mar. 6, 1980

PCT Filed Jul. 31, 1979, Ser. No. 190,317

Claims priority, application United Kingdom, Aug. 8, 1978, 32608/78

Int. Cl.³ B65G *57/00*

U.S. Cl. 198—509 6 Claims



1. A mechanical handling apparatus for reclaiming material from a stockpile including a wheeled frame moveable on rails extending to each side of the stockpile; a support structure mounted on said wheeled frame; drive means for traversing the wheeled frame in either direction along the rails; a rotatable cylindrical drum mounted on the support structure and provided with a plurality of blind scoops each open in opposed directions for scooping material from the stockpile; first and second transfer conveyors mounted on the support structure and extending to each external side of the drum in a direction parallel to the axis of rotation thereof, for receiving material discharged from the blind scoops; means for angularly displacing of the first and second conveyors to move the conveyors independently between an operative position and raised position such that when one conveyor is in the operative position to receive material from the blind scoops the other conveyor is in the raised position clear of the stockpile; and means for rotating the durm such that the blind scoops open in one direction serving with clockwise rotation of the drum to scoop material from a first portion of the stockpile to one side of the drum; and upon further clockwise rotation of the drum discharge the material therefrom to the first transfer conveyor at the side of the drum remote from the first portion of the stockpile and blind scoops open in the opposed direction serving with anti-clockwise rotation of the drum to scoop material from a second portion of the stockpile to the side of the drum remote from the second portion and, upon further anti-clockwise rotation of the drum, discharge the material therefrom to the second transfer conveyor.

4,336,877

## FOLDABLE UNLOADING MACHINE

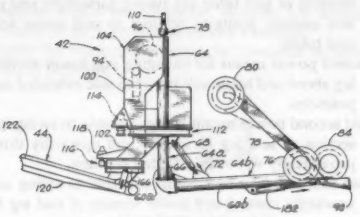
Charles B. Gill, San Mateo, Calif., assignor to Fruehauf Corporation, Detroit, Mich.

Division of Ser. No. 74,719, Sep. 12, 1979, Pat. No. 4,264,003.

This application Feb. 10, 1981, Ser. No. 233,150

Int. Cl.³ B65G *17/36, 21/10*

U.S. Cl. 198—509 8 Claims



1. An unloading machine for bulk materials, comprising

an endless bucket train having a plurality of longitudinally spaced buckets which are circular in cross section,

said bucket train including a plurality of flexible tension elements extending axially between the successive buckets in the train,

a generally vertical supporting leg including first and second parallel guide tubes for receiving and guiding said bucket train which is movable downwardly within said first guide tube and upwardly within said second guide tube,

a vertically swingable boom having an inner end with a pivotal connection between said inner end and the lower end portion of said leg whereby said boom is swingable vertically about the pivot axis of said pivotal connection,

said boom projecting forwardly from said leg,

first power means for swinging said boom vertically about said pivot axis,

a first conveyor wheel supported in the locality of said pivotal connection for causing said bucket train to travel out of the lower end of said first guide tube and then outwardly along said boom,

a second conveyor wheel rotatably mounted on the outer end portion of said boom for supporting said bucket train and causing said bucket train to be directed downwardly from the outer end portion of said boom,

a third conveyor wheel disposed near the lower end of said second guide tube for directing said bucket train into the lower end of said second guide tube,

said bucket train being suspended in a catenary curve between said second and third conveyor wheels for digging a bulk material and carrying it upwardly in said buckets within said second guide tube,

a fourth conveyor wheel disposed near the upper end portion of said leg for receiving the bucket train from the upper end of said second guide tube and carrying said bucket train downwardly to dump the bulk material from said buckets,

a fifth conveyor wheel for receiving said bucket train from said fourth conveyor wheel and again directing the bucket train upwardly,

and a sixth conveyor wheel for receiving said bucket train from said fifth conveyor wheel and directing said bucket train downwardly into the upper end of said first guide tube,

said leg having upper and lower sections with a hinged joint therebetween to provide for forward and upward folding movement of said lower section about the hinge axis of said hinged joint,

said hinge axis being disposed on the forward side of said leg,

said hinge axis being horizontal and generally parallel with the pivot axis of said boom,

said parallel guide tubes having longitudinal axes in a plane which is parallel with said hinge axis,

each of said guide tubes having upper and lower sections on said upper and lower sections of said leg,

said lower section of said leg being swingable about said hinge axis of said hinged joint between a downwardly extended position in which the lower sections of said tubes are aligned with the upper sections thereof and a forwardly and upwardly folded position in which said lower sections of said tubes are swung forwardly and upwardly into angular positions relative to said upper sections of said tubes,

second power means for swinging said lower section of said leg about said hinge axis between said extended and folded positions,

said second power means being operable to swing said lower section of said leg forwardly and upwardly through approximately 90° to said folded position,

said first power means being operable to swing said boom upwardly toward said lower section of said leg for maximum compactness in said folded position,

said machine being more compact vertically when the lower section of said leg is in its folded position.

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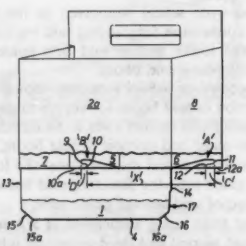
**4,336,878**

## ARTICLE CARRIER HAVING IMPROVED LOCKING MEANS

**Prentice J. Wood, Hapeville, Ga., assignor to The Mead Corporation, Dayton, Ohio**

**Filed Oct. 3, 1980, Ser. No. 193,783**
**Int. Cl.³ B65D** *5/48, 75/00*
**U.S. Cl. 206—173** **5 Claims**



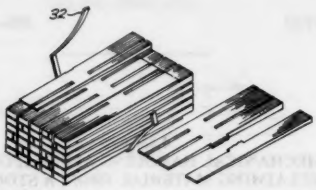

1. A cellular article carrier of the basket-style comprising a bottom panel (1), opposed sidewalls (2, 2*a*) foldably joined to opposite side edges of said bottom panel, end panels (7, 8) foldably joined to the ends of said sidewalls and extending transversely inward therefrom, medial riser panels (5, 6) foldably joined to said end panels respectively, locking means (A, B) formed in said riser panels adjacent the lower ends thereof at each end of the carrier for respectively receiving cooperating locking means (15, 16) provided by the bottom panel so as to hold the carrier in squared, set-up condition, characterized in that the relative dimensions of the locking means are such that when one riser panel locking means (A) is caused fully to engage its cooperating bottom panel locking means (16) during inward displacement of said one riser panel (6), the other riser panel locking means (B) simultaneously is caused to clear its cooperating other bottom panel locking means (15) by an amount necessary to achieve locking cooperation between said other locking means (B, 15) when said inward displacement is ceased.

**4,336,879**

## SHIM BUNDLE

**Charles E. Carr, Olympia, Wash., assignor to Carr Cedar Products, Inc., Shelton, Wash.**

**Division of Ser. No. 953,960, Oct. 23, 1978, Pat. No. 4,223,432.**
**This application May 9, 1980, Ser. No. 148,550**
**Int. Cl.³ E04D** *1/28*
**U.S. Cl. 206—323** **3 Claims**




1. A bundle of shims comprising an elongated pack of shim stock pieces stacked in several courses, each of said pieces being tapered lengthwise of said pack, and a band encircling said pack transversely of its length and defining a plane extending generally centrally between the opposite ends of said pack, each end portion of said pack having a plurality of substantially parallel, transversely spaced kerfs through said several courses of said pack and extending lengthwise inward from the end of such end portion toward said band only partway through such end portion, each kerf having an inner end located adjacent to the plane defined by said band, the kerfs in one end portion of said pack being in substantially mutual registration with the kerfs in the other end portion of said pack so that said shim stock pieces of each course of said pack have short joining sections between the inner ends of the oppositely extending kerfs straddled by said band and enabling said pieces, after being removed from said pack, to be manually separated into individual shims by breaking said joining sections.

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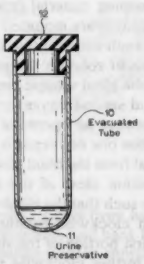
**4,336,880**

## PRESERVATION OF URINE SPECIMENS

**Jack J. Mehl, Landing, N.J., assignor to Becton, Dickinson and Company, Paramus, N.J.**

**Division of Ser. No. 3,237, Jan. 15, 1979, Pat. No. 4,258,032.**
**This application Nov. 24, 1980, Ser. No. 209,816**
**Int. Cl.³ A01N** *37/00, 59/14;* **B65D** *85/00, 81/20*
**U.S. Cl. 206—524.4** **6 Claims**




1. A sample device for urine, comprising:

an evacuated sample container for urine and a bacteriostatic liquid preservative for urine in said evacuated sample device, said liquid preservative comprising boric acid, alkali formate and a liquid selected from the group consisting of water and glycerine in amounts effective to provide a liquid preservative for a urine sample, said boric acid and alkali formate being dissolved in the liquid to provide

from 0.9 to 1.2% of boric acid and from 0.5 to 0.6% of alkali formate in a urine sample.

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**4,336,881**

## AQUEOUS ACID CONCENTRATE FOR HEMODIALYSIS DIALYSATE

**Albert L. Babb, and Belding H. Scribner, both of Seattle, Wash., assignors to Diachem, Inc., Arlington Heights, Ill.**

**Continuation-in-part of Ser. No. 48,757, Jun. 14, 1979, abandoned. This application Mar. 24, 1980, Ser. No. 132,866**

**Int. Cl.**[3] **B65D** *85/00*

**U.S. Cl. 206—525** **8 Claims**

1. A sealed unit dose container containing therein an aqueous acid concentrate composition for compounding a hemodialysis dialysate which composition comprises water, dissolved solid salts and hydrochloric acid in an amount of about 93.9 milliliters/liter to about 127.7 milliliters/liter (expressed as aqueous 11.6 N HCl); the composition containing chloride ion in a concentration of about 3.5 Molar to about 4.7 Molar, sodium ion in a concentration of about 1.9 Molar to about 2.7 Molar, acetate group in a concentration of 0 Molar to about 0.525 Molar, potassium ion in a concentration of 0 Molar to about 0.14 Molar, calcium ion in a concentration of 0 Molar to about 0.125 Molar, magnesium ion in a concentration of 0 Molar to about 0.09 Molar, and dextrose in a concentration of 0 Molar to about 0.4 Molar; said composition having a pH value of about 1 to about 2.5.

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**4,336,882**

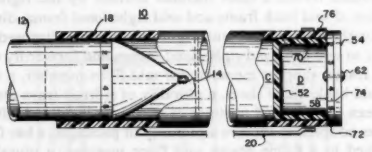
## PEN PILL CONTAINER

**Sydney M. Sakwa, 83 Ivy Hill Dr., Aberdeen, N.J. 07747**

**Filed Jan. 8, 1979, Ser. No. 1,666**

**Int. Cl.**[3] **B65D** *83/04, 85/42*

**U.S. Cl. 206—537** **2 Claims**




1. A tubular dispenser fitted with a plurality of individual compartments for housing of pills, with

each said compartment formed with an individual opening that is closed by an individual detachable plug unit, with at least

one of said plug units shaped in the form of a hollow enclosed container adaptable for the storage and dispensing of powdered material such as dietetic salt or sweetener powder, with the interior of said hollow container closed by a cover fitted with a plurality of perforations for dispensing of powder, together with means to alternatively align said perforations with the interior of the said container or to alternatively block said perforations from communication with the said container interior.

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**4,336,883**

## INSULATED CONTAINER

**James E. Krug, Irvine; Roger W. Magenau, Tustin, and Jack P. Hall, Palo Alto, all of Calif., assignors to Divajex, Tustin, Calif.**

**Filed Jun. 9, 1980, Ser. No. 157,511**

**Int. Cl.**[3] **A45C** *11/20;* **F25D** *3/08;* **B65D** *81/18*

**U.S. Cl. 206—545** **10 Claims**

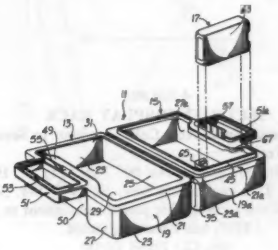
1. A portable insulated container comprising:

first and second container sections;

each of said container sections including a frame section, a housing section of foam plastic and means for mounting the housing section on the frame section of the associated container section;

said frame sections being integrally constructed of self-hinging plastic material, said self-hinging plastic material integrally joining said frame sections of the first and second container sections and defining hinge means for joining said container sections for hinged movement between a closed position in which the first and second container sections define an essentially closed chamber and an open position in which the container sections are separated sufficiently to provide access to said chamber;

latch means for releasably holding the container sections in the closed position;




means on at least one of the container sections for removably mounting a thermal pack;

handle means coupled to at least one of the container sections to facilitate carrying of the insulated container; and

said mounting means of said first container section including at least one recess in the frame section of said first container section with said recess being adjacent and opening toward the housing section of the first container section and an adhesive contacting the housing section of the first container section and at least partially filling the recess in the frame section to adhesively attach the foam plastic of the housing section of the first container section to the self-hinging plastic material of the frame section of the first container section.

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**4,336,884**

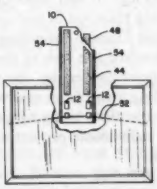
## EASY MOUNT PICTURE PACKAGE

**LeRoy Hart, 273 Main St., Farmington, Conn. 06032, and Mark L. Hart, 27-I Amato Dr., South Windsor, Conn. 06074**

**Filed Dec. 14, 1979, Ser. No. 103,864**

**Int. Cl.**[3] **B65D** *69/00, 71/00*

**U.S. Cl. 206—575** **13 Claims**




1. A package assembly combining a picture hanger locator and a picture hanger comprising an elongated generally rectangular hanger-locating backing sheet of cardboard-like material having hanger-receiving means adjacent one longitudinal end thereof for receiving and orienting a hanger in longitudinal alignment with the longitudinal dimension of the backing sheet, first elongated adhesive means on the backing sheet having a first exposed adhesive surface for removably securing the front face of the backing sheet to a picture frame, said first

adhesive surface extending from a point adjacent said hanger-receiving means longitudinally along said backing sheet to a point adjacent the end of said sheet opposite said one end, second adhesive means having a second exposed adhesive surface for removably securing said opposite end of the backing sheet to a picture frame support, a picture hanger mounted on said backing sheet by said hanger-receiving means and having a forwardly extending hook portion projecting outwardly from the front face of said sheet, said sheet having a length sufficient to extend well beyond the top edge of a picture attached to said hook when said hanger is mounted on said sheet and a removable protective covering overlying said first and second adhesive surfaces for keeping said surfaces free of contamination prior to use.

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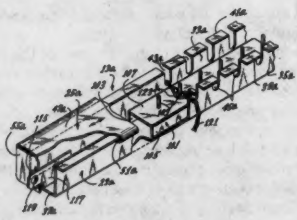
**4,336,885**

## SECURITY DISPLAY RACK

**Robert E. Thomas, Santa Ana, Calif., assignor to Securax, Inc., Ft. Worth, Tex.**

**Continuation-in-part of Ser. No. 907,770, May 19, 1978, Pat. No. 4,204,601. This application Nov. 29, 1979, Ser. No. 98,340**
**The portion of the term of this patent subsequent to May 27, 1997, has been disclaimed.**
**Int. Cl.³ F05B *73/00***
**U.S. Cl. 211—4** **9 Claims**



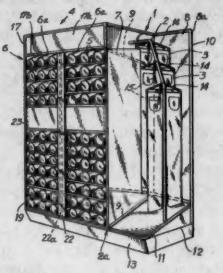
1. A security display rack for articles, said rack comprising:
an elongated outer channel having first and second legs and a web interconnecting said legs, said legs extending from the web and at least said first leg terminating in an elongated outer edge;
at least said first leg having a plurality of notches extending through said first leg and opening at said outer edge of the first leg;
an inner channel having first and second legs and a web interconnecting said legs of said inner channel;
said inner channel being received in said outer channel with said legs of said inner channel extending from the web of the inner channel toward the web of the outer channel;
a plurality of projections carried by the web of the inner channel and extending away from said webs of said channels, each of said projections being adapted to engage one of the articles with such article projecting through at least one of said notches;
an elongated locking member;
means for mounting the elongated locking member on the outer channel for movement between a closed position in which the locking member closes the open ends of the notches sufficiently to impede removal of the articles from the notches and an open position in which the articles can be removed from the notches and the projections;
locking means for locking the locking member in said closed position; and
means coupled to the outer channel for elevating the outer channel above a surface.

**4,336,886**

## DISPLAY AND DISPENSING DEVICES FOR GARMENTS

**Moshe Azoulay, 1125 Texas Ave., El Paso, Tex. 79901, and Albert B. Smith, 6001 LaCumbre, El Paso, Tex. 79912**

**Filed Oct. 4, 1979, Ser. No. 81,934**
**Int. Cl.³ A47F *7/19***
**U.S. Cl. 211—13** **13 Claims**



1. A device for display and storage of garments comprising a storage section and a selection section, said storage section including a vertically disposed right-hand frame, a vertically disposed left-hand frame, a crown frame fixedly attached to an upper terminal portion of said vertical left and right-hand frames, said crown frame consisting of a plurality of sections approximately horizontally disposed to said vertical left and right-hand frames, a vertical back frame fixedly attached to said vertical left and right-hand frames, a sheet for said left and right-hand frame, a partial sheet for said back frame and a right most portion of said back frame and a right most portion of said right-hand frame, a floor member defined by the right most portion of said back frame and said right-hand frame, disposed abuttingly to said back and right-hand frame, disposed abuttingly to said back and right-hand frames and forwardly of said back frame; support members for said floor member, a mirror for said back frame sheet, a plurality of storage trays disposed between the terminal portions of said right-hand and left-hand frames adopted to receive a plurality of packages, a bar fixedly attached to a frame above said floor member, a plurality of garments for inspection of same permanently incorporating hangers within each of said garments and an extendable attachment for each of said hangers from said bar to said hanger for removal of same for a predetermined distance.

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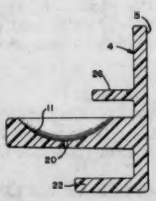
**4,336,887**

## EYE GLASS, RING AND WATCH HOLDER

**Peter F. Dunne, P.O. Box 6201, Hayward, Calif. 94540**

**Filed Jun. 12, 1980, Ser. No. 158,682**
**Int. Cl.³ A47F *7/02***
**U.S. Cl. 211—13** **3 Claims**



1. A wall mounted eye glass, ring and watch holder comprising:
a. a base;
b. mounting means connected to said base and adapted for attachment to said wall surface;

c. an eye glass holder member adapted for holding eye glasses with ear lugs connected to said base and extending outwardly therefrom, formed with a depression adapted for receiving the nose guards of said glasses and having shoulders spaced on opposite sides of said depression a distance substantially less than the distance between said ear lugs adapted for supporting a portion of the rims of said glasses;

d. said holder member depression having a depth and width sufficient and adapted to retain finger rings; and

e. a stop member connected to said base above said eye glass holder member and protruding therefrom at approximately the mid-portion of said eye glass holder member a distance from said base substantially less than the distance of the eye glass holder from said base and adapted for receiving said eye glasses between said stop member and said eye glass holder for preventing said eye glasses from tipping and falling out of said holder.

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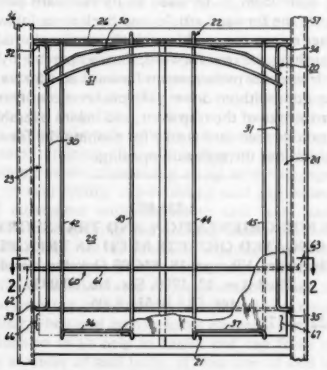
4,336,888

## HOLDER FOR STIFFLY FLEXIBLE SHEETS

Robert T. Fuller, 1351 Empire St., Anaheim, Calif. 92804, and Robert J. Sanders, 2200 E. Oskosh Cir., Anaheim, Calif. 92806

Filed Jun. 18, 1979, Ser. No. 49,591
Int. Cl.[3] A47F 7/16
U.S. Cl. 211—45 14 Claims



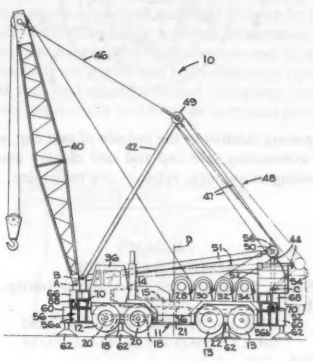
1. A holder for sheets likely to curl at their edges and corners, said holder having a proximal edge, a distal edge, and two side edges joining said proximal and distal edges, an opening being formed within said edges a top rail at each edge to restrain upward movement of the sheet, a bottom restraint and an edge restraint at the proximal edge, bottom support means for the sheet beneath said opening, a deflector extending from one of said two side edges to the other and having a pilot edge which faces concavely toward said proximal edge above and spaced from said bottom restraint, said deflector progressively engaging the distal end of the sheet when it is pushed past it toward said distal edge of said holder, whereby to guide it beneath said top rail at the distal edge, and a gap adjacent to the junction of said proximal edge and each of said side edges to provide the sheet with access to beneath the top rails at each side edge for insertion of said sheet.

4,336,889

## RING SUPPORTED TRUCK CRANE AND METHOD OF SETTING UP

Bernard L. McGrew, Cedar Rapids, Iowa, assignor to FMC Corporation, Chicago, Ill.

Filed Oct. 27, 1980, Ser. No. 200,844
Int. Cl.[3] B66C 23/78, 23/26
U.S. Cl. 212—178 22 Claims



1. A self-propelled ring supported truck crane comprising a chassis mounted on ground engaging transporting members and supporting a boom for pivotal movement relative to said chassis only about a horizontal axis, means defining a ring having a vertical axis, ground engageable jack means connected to said ring for moving said ring between an inactive position spaced below said chassis and an active position supporting said chassis, rotatable means interposed between said chassis and said ring means for rotatably supporting said chassis on said ring when said jack means elevates said ring sufficiently to lift the chassis and transporting members clear of the ground, and selectively operable drive means interconnecting said chassis with said ring for rotating said chassis about said vertical axis.

19. A method of setting up and operating a self-propelled ring supported truck crane which includes a chassis and wheel assembly with a boom pivoted relative to the chassis only about a horizontal axis; said method comprising the steps of interconnecting several segments of the ring at a working site to define an incomplete ring having an access opening and a vertical axis, driving the chassis through the opening into the ring with one end thereof overlying a portion of the ring, closing the opening by securing at least one ring segment to the incomplete ring with said added segment underlying the other end of said chassis, rotatably supporting said chassis on said ring in response to raising said ring sufficiently to lift the chassis and wheel assembly free of the ground, and drivingly interconnecting said chassis and ring for rotating said chassis and boom in selective directions about said vertical axis.

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4,336,890

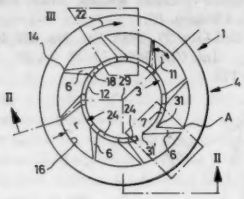
## CAP OR CLOSURE FOR TUBES AND BOTTLES

Hans H. Möhlmann, Bremen, Fed. Rep. of Germany, assignor to Shortland Engineering International Anstalt, Schaan, Liechtenstein

Filed Jun. 18, 1980, Ser. No. 160,666
Claims priority, application Fed. Rep. of Germany, Jul. 3, 1979, 2926730
Int. Cl.[3] B65D 45/32
U.S. Cl. 215—272 25 Claims

1. A closure for releasably closing articles having a wall forming an outlet opening, comprising a cup-shaped cap adapted to be sealingly connected to the outlet and having an internal diameter that is essentially the same as the external

diameter of the wall of the article to be closed, a substantially tubular closure member positioned around said cap but having



a radial spacing relative to the outside of said cap, and at least one web connecting said cap and said closure member, said web extending at an angle relative to a radial line.

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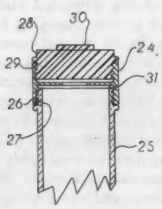
**4,336,891**

## ADAPTER CLOSURE

**Jack D. Smith, Billings, Mont., assignor to Smithy, Inc., Billings, Mont.**

**Filed Jun. 9, 1980, Ser. No. 157,262**
**Int. Cl.³ B65D *45/30, 45/32, 45/34***
**U.S. Cl. 215—276** **5 Claims**



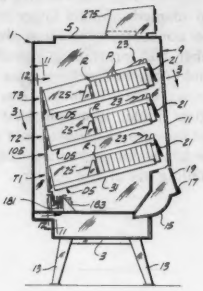
1. An adapter closure for a container including a unitary body portion with a substantially uniform outside diameter, an axial passage extending through said body portion, an inwardly extending shoulder portion disposed along the length of said body portion intermediate the ends thereof, a first internally threaded section extending from one end of said body portion toward and terminating closely adjacent to said shoulder portion, a second internally threaded section extending from the opposite end of said body portion toward and terminating closely adjacent to said shoulder portion, said first and second internally threaded sections being of substantially the same diameter and length, the end of said body portion adjacent said second internally threaded section including an exposed lip surface, a plug member engageable with said second internally threaded section and sealing one end of said body portion, said plug member including an externally threaded section engageable with said second internally threaded section, said plug member also including a cover section, said cover section including a sealing surface engageable with said lip surface of said body portion, said cover section including a peripheral portion having a diameter substantially the same as that of said body portion; whereby said first internally threaded section normally is selectively removable from an externally threaded section of a container while said plug member is engaged with said second internally threaded section and said plug member being removed from said second internally threaded section and said second section threaded onto an externally threaded section of a second container similar to said first container to transfer contents of said first container to said second container.

**4,336,892**

## ARTICLE DISPENSING APPARATUS

**Robert N. Cox, Bridgeton, and James E. Rawlings, St. Louis, both of Mo., assignors to UMC Industries, Inc., Stamford, Conn.**

**Filed May 22, 1980, Ser. No. 150,348**
**Int. Cl.³ G07F *11/32***
**U.S. Cl. 221—125** **24 Claims**



18. Article dispensing apparatus comprising means for bottomwise supporting a row of articles to be dispensed, stop means at one end of said supporting means constituting its forward end engageable by the forward article of the row, said supporting means having an opening at its forward end rearward of the stop means for downward discharge of the forward article, a trap door movable endwise of the supporting means between a forward position closing said discharge opening and a rearward retracted position for downward discharge of the forward article through said opening, means for moving said trap door from its forward to its rearward position for discharge of the forward article, and back to its forward position, pusher means engageable with the rearward article of the row for pushing the row forward, means operable by the trap door for driving the pusher means forward on a forward stroke of the trap door without driving the pusher means rearward on a rearward stroke of the trap door, and means operable by the trap door on its rearward stroke for pushing the forward article down and out through said opening.

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**4,336,893**

## DEVICE FOR ORIENTATION AND TRANSPORTATION OF ELONGATED OBJECTS SUCH AS TREE PLANTS

**Ingvar Törnström, Viberget 18, 816 00 Ockelbo, Sweden**

**Filed Apr. 13, 1979, Ser. No. 30,033**
**Int. Cl.³ B65H *9/06***
**U.S. Cl. 221—171** **7 Claims**

1. A device for orientation and transportation of elongated objects having a center of gravity, comprising in combination,

(a) a container having walls spaced apart a distance greater than the width of said object,

(b) a slot at the bottom of said container,

(c) first means forming the bottom of said container disposed between said side walls and said slot and forming said slot,

(d) second means coupled to said first means to widen said slot a predetermined distance until the center of gravity of said object has reached said slot to orient said object in an upright position, and

(e) third means responsive to further widening of said slot to direct said object away from said slot.

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**4,336,894**

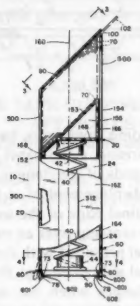
**TICKET DISPENSER**

**LeRoy D. Crye, 13906 Hickory St., Omaha, Nebr. 68144, and Leonard F. Fischman, 5209 Emeline St., Omaha, Nebr. 68157**

**Filed Jun. 2, 1980, Ser. No. 155,541**

**Int. Cl.³ B65G *59/08***

**U.S. Cl. 221—280** **12 Claims**



1. A ticket dispenser having a hollow body for receiving a stack of tickets in its upper portion, a ticket pushing head in said body, a spring in said body beneath said head and pressing upwardly on said head, said body guiding movement of said head along a vertical axis, said body having upwardly extending side walls one of which is a forward side, an exit slot through the top of said forward side, said body having an upper wall, a ticket manipulation opening through said upper wall large enough to receive an operator's thumb as it presses a ticket toward said exit slot, the inner and outer sides of said upper wall of said body being inclined with respect to said axis sufficiently as to make substantially easier the pushing out of tickets, means retaining the said spring in said body, said spring-retaining means comprising a cap means engaging the lower end of said spring, cap-retaining said cap means from downward movement with respect to said body, said cap-retaining means comprising said end cap means and said body having at least one set of mutually lapping portions, each lapping portion having an interlockable element thereon cooperative with an interlockable element on the other lapping portion and assisting in a locking of said end cap means and body together when said interlockable elements are in normal state positions so as to help to retain end cap from moving away from a center of said body, at least one of said lapping portions being flexible and resilient and movable away from its normal state position so that its interlockable element separates from the other of said interlockable elements whereby they cease to interlock and no longer prevent said cap from being temporarily removed from said body for the filling of said body with tickets.

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**4,336,895**

**FINGER ACTUATED PUMP ASSEMBLY**

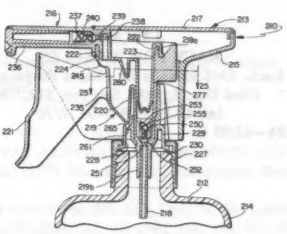
**Hans P. Aleff, Old Sneech Pond Rd., Pole 188, R.D. 2, Cumberland, R.I. 02864**

**Continuation-in-part of Ser. No. 819,880, Jul. 28, 1977, Pat. No. 4,201,317. This application Feb. 25, 1980, Ser. No. 125,083**

**Int. Cl.³ B67D *5/40***

**U.S. Cl. 222—207** **19 Claims**

1. A manually operable pump for dispensing non-compressible liquid product comprising, a body, said body including container sealing means for forming a liquid tight engagement with a product container at one portion thereof and product discharge means including a discharge opening at another portion thereof, a resilient non-ballooning type bellows of relatively rigid construction which is collapsible upon application of pressure thereto, said bellows positioned in said body and forming a chamber for receipt of product from said container and subsequent dispensing thereof outwardly of said body, actuation means connected with said bellows for initially collapsing said bellows to apply a threshold pressure to said liquid, product discharge valve means at one end of said bellows and communicating with said body discharge opening to normally seal such and wherein further collapsing movement of said bellows sequentially builds up an increased pressure so



as to alter the position of said discharge valve means from said normally closed position to an open position and forces product within said chamber outwardly of said discharge opening, and product entry valve means separate from said bellows positioned at the other end of said bellows for directing product into said chamber upon expansion of said bellows wherein said product moves through said chamber from said one end to the said other end upon said further collapsing of said bellows, said actuation means being a finger actuated trigger privotally supported from said body for arcuate movement with respect thereto, said bellows including a forwardly disposed relatively rigid front side wall positioned with respect to said body for arcuate movement about generally the same pivot point as said trigger such that said front wall and said trigger move as a unit, said trigger being integral with said relatively rigid bellows front wall.

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**4,336,896**

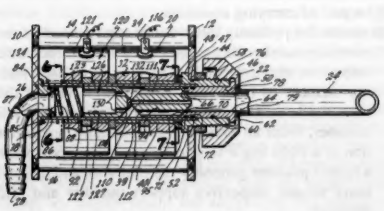
**ELECTRICALLY CONTROLLED IN-LINE DISPENSING FAUCET**

**John A. Lunau, Pfaffenberger Weg. 270 Bruhler Str. 49-51, D-5650 Solingen, Fed. Rep. of Germany**

**Filed Dec. 31, 1979, Ser. No. 108,372**

**Int. Cl.³ B67D *3/00*; F16K *31/02***

**U.S. Cl. 222—504** **5 Claims**



1. In an electrically operated in-line dispensing faucet, in combination, tubular means having an inlet flow tube and an outlet flow tube, means forming a valve seat in the tubular

means, valve means in the form of a plunger which is reciprocatable in the tubular means, the said valve means being configurated to seat on the seat and having channel means formed in it for flow of fluid through it and electromagnetic means positioned around the tubular means for producing reciprocating movement of the said plunger means, second plunger means within said tubular means in-line with said first mentioned plunger, second electromagnetic means positioned around said tubular means and a source of pulsating D.C. voltage for said second electromagnetic means, said second electromagnetic means being connected to produce reciprocation of said second plunger means, said first and second plunger means being configurated whereby the second plunger means is operable to intermittently engage the first plunger means and prevent flow of fluid therethrough.

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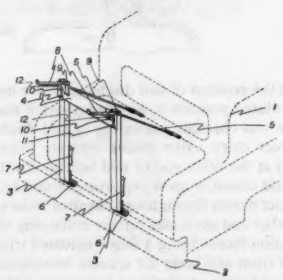
4,336,897

## RACK FOR BICYCLES

Arthur J. Luck, 1365 Estrella Dr., Santa Barbara, Calif. 93110

Filed Dec. 3, 1980, Ser. No. 212,738
Int. Cl.³ B60R 9/06, 9/10
U.S. Cl. 224—42.03 B 6 Claims



1. A foldable rack mountable on vehicles, comprising:

(a) a spaced pair of generally vertical support members, having their lower ends supported by the upper surface of the bumper or other projecting surface of the vehicle;

(b) means for retaining lower ends of said support members on said upper surface;

(c) a horizontal upper cross member;

(d) means for pivotally interconnecting each end of said cross member with a point near the top end of one of each said support members; so as to allow each support member to rotate about an axis perpendicular to the plane common to said cross member and said support members from a position extended orthogonal to said cross member to a folded position parallel with and in close proximity to said cross member;

(e) a pair of carrying members;

(f) means for pivotally interconnecting one end of each said carrying member to the upper end of said rack adjacent a respective support member, so as to allow each said carrying member to rotate in a plane orthogonal to the plane common to said extended support members and said cross member, from an extended substantially horizontal position at a right angle to said respective support member to a folded position generally parallel with and in close proximity to said respective support member and said cross member;

(g) means for locking said extended support members and said cross member in a substantially rectangular array, and

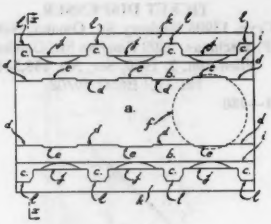
(h) means for supporting said rack in a generally upright position.

4,336,898

## CARRIERS FOR CONTAINERS, APPARATUS AND METHOD FOR APPLYING SAME TO CONTAINERS

Michael F. Joyce, 25 Rangewood Ave., Kennet Valley, Reading RG3 3NN, Berkshire, England

Filed Sep. 27, 1978, Ser. No. 946,124
Int. Cl.³ B65D 61/00
U.S. Cl. 294—87.28 8 Claims



1. A carrier for holding containers having a flanged end piece, the carrier comprising, a top panel able to lie superimposed over part of the ends of the flanges to be held and prevent relative outward displacement of at least one side panel connected to a longitudinal edge of the top panel by a line of hinge, the line of hinge crossing over an outward part of each flange end, the side panel provided with slot cuts each defining an edge of the side panel able to engage the underside of such outward part of the flanges when the side panel is moved angularly toward the containers, the improvement characterised in that the said side panel for engaging the flanges is an intermediate single thickness panel of the carrier where the other longitudinal side panel edge is a lower edge hinged to connecting member ends, an inside panel hinged to the connecting member other ends, the inside panel having outwardly extending edge portions, each connecting member disposed adjacent a respective container body part of the containers when the underside of the top panel and the inside panel are pressed together and overlaying the container flange ends with the edge portions outwardly extending from the inside panel and contained laterally by their engagement with an inwardly facing part of the containers or carrier side panel, thereby retaining the lower edge of the side panel and its slot cuts each engaging the underside of a container flange.

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4,336,899

## CARRYING SLING

Carroll D. Price, II, 11821 SW. 104 Ct., Miami, Fla. 33176

Filed Nov. 24, 1980, Ser. No. 210,017
Int. Cl.³ A45F 5/00
U.S. Cl. 224—202 9 Claims

1. A carrying sling 12 for a generally cylindrically shaped scuba tank 14 of predetermined height having an upper rounded end zone with an axially projecting valve means 18 and a closed lower end 20 of predetermined diameter, said sling comprising,

an end cup **22**, said end cup having a cylindrical side wall sized to nest about the lower end of the tank and a floor **24** to underlay the tank end,

said end cup including a radially extending portion **26**,

said floor comprised of an openwork having a plurality of radially extending portions and a central zone,

a flexible strap **28** having an upper end **30** and a lower end **32** and of a length greater than the predetermined height of the tank,

means **34** on the lower strap end to connect to the radially extending portion, and

ring means **36** on the upper strap end sized for passage over the projecting valve means, whereby the lower end of the tank is adapted to be received in the end cup and the ring means are adapted to connect about the projecting valve means whereby the strap may be used as a carrying sling for the scuba tank.

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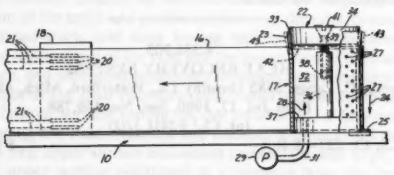
**4,336,900**

## ADJUSTABLE TAPE GUIDING METHOD AND APPARATUS

**George E. Pontoni, La Habra, Calif., assignor to Bell & Howell Company, Chicago, Ill.**

**Filed Jul. 17, 1980, Ser. No. 169,698**
**Int. Cl.³ B65H *17/32*; G65H *23/32*; G03B *1/50***
**U.S. Cl. 226—97** **35 Claims**



**19**. In apparatus for advancing a tape, the improvement comprising in combination:

a hollow-cylindrical tape guide having a continuously annular edge region having circumferentially an elasticity pursuant to Hooke's law;

a slanted member engaging said hollow-cylindrical tape guide at an edge region;

means for applying said advancing tape to said tape guide; and

means connected to said slanted member for providing said hollow-cylindrical tape guide with a taper at said edge region by forcing said slanted member into said edge region, whereby a circumferential variation of said continuously annular edge region is imposed thereon and a force is imposed on said tape.

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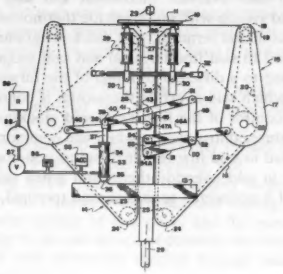
**4,336,901**

## INJECTION ASSEMBLY

**Benjamin C. Gray, Box 1768, Brooks, Alberta, Canada T0J 0J0**

**Filed Mar. 24, 1980, Ser. No. 133,022**
**Claims priority, application Canada, Apr. 10, 1979, 325415**
**Int. Cl.³ B65H *17/34***
**U.S. Cl. 226—173** **13 Claims**

**1**. A tubing injector for well drilling and the like comprising in combination supporting structure, an opposed pair of injector halves supported in said supporting structure, an endless drive chain assembly for each half including tube gripping runs of said chain assemblies, said runs being situated in substantially spaced apart relationship to one another, said runs of chain assemblies engaging the tubing therebetween, means to drive said chain assemblies, means mounting said injector halves upon said supporting structure for independent floating movement towards and away from one another, and adjustable pressure means in said supporting structure to urge said halves



towards one another whereby said runs of chain grip said tubing frictionally.

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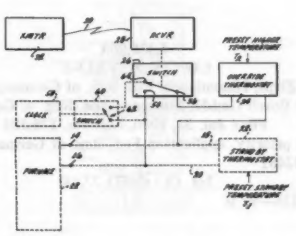
**4,336,902**

## THERMOSTAT ALTERABLE BY REMOTE CONTROL

**Albert D. Neal, 17272 Blue Fox Cir., Huntington Beach, Calif. 92647**

**Continuation of Ser. No. 846,517, Oct. 28, 1977, abandoned.**
**This application Jul. 13, 1981, Ser. No. 282,403**
**Int. Cl.³ G05D *23/00***
**U.S. Cl. 236—46 R** **8 Claims**



**1**. In a clock-programmed temperature control system including a furnace having two electrical terminals and producing heat when a conductive electrical connection is established between the terminals, including a standby thermostat connected between the two terminals of the furnace and establishing an electrical connection between them when said standby thermostate senses the ambient temperature to be less than a preset standby temperature and opening the electrical connection between them when said standby thermostat senses the ambient temperature to be greater than the preset standby temperature, and including a clock-programmed switch connected in series with an override thermostat to form a series combination which series combination is connected across the furnace terminals in parallel with said standby thermostat, said override thermostat being operative only when said clock-programmed switch is closed to establish an electrical connection between the two terminals of the furnace when said override thermostat senses the ambient temperature to be less than a present higher temperature greater than said standby temperature and opening the electrical connection between the two terminals of the furnace when said override thermostat senses the ambient temperature to be greater than the preset higher temperature, an improvement for selectively overriding the clock-programmed temperature control system and transferring control of the furnace to said override thermostat, and later for returning control of the clock-programmed temperature control system, said improvement comprising:

a remotely controlled single pole double throw electrical

switch responsive to applied commands to selectively connect a common terminal to a first and a second terminal, said switch being connected in said series combination between said override thermostat and said clock-programmed switch with said override thermostat connected to said common terminal, said clock-programmed switch connected to said first terminal and said second terminal connected to a different terminal of the furnace than the one to which said override thermostat is connected so as to vest control of the furnace in said clock-programmed temperature control system when said common terminal is connected to said first terminal and to vest control of the furnace in said override thermostat when said common terminal is connected to said second terminal.

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4,336,903

## CONTROL VALVE

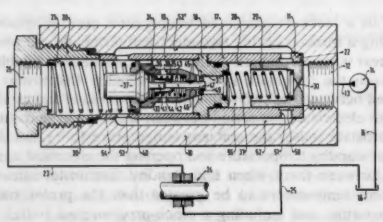
Wilhelm Zirps, Hemmingeb, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jul. 31, 1980, Ser. No. 175,183

Claims priority, application Fed. Rep. of Germany, Aug. 10, 1979, 2932481

Int. Cl.³ G05D *27/00*

U.S. Cl. 236—92 R 9 Claims



1. A control valve for keeping constant viscosity or temperature of a pressure medium in a hydraulic circuit, comprising a valve housing defining an inlet and an outlet for the pressure medium; a control slider arranged for reciprocating movement in said housing and including means for throttling said medium; a preliminary control valve arranged in said housing downstream of said throttling means in said control slider and including a temperature sensitive control element made of a thermally extendable material which controls said additional throttling means, said preliminary control valve including a poppet and a valve seat, said poppet being controlled through said temperature sensitive control element and being spring biased against said valve seat, said poppet being formed with a blind bore defining a shoulder at its open end and said control element being seated on said shoulder.

4,336,904

## DELIVERY STABILIZER FOR VENTILATION SHAFT

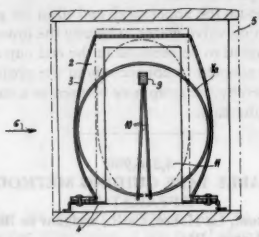
Pierre Jardinier, Gournay sur Marne, and Jack Simonnot, Lesigny, both of France, assignors to Societe d'Etudes et de Recherches de Ventilation et d'Aeraulique S.E.R.V.A., Gournay sur Marne, France

Filed Sep. 29, 1980, Ser. No. 192,028

Claims priority, application France, Oct. 5, 1979, 79 24829

Int. Cl.³ G05D *27/00*

U.S. Cl. 236—92 R 10 Claims



2. Stabilizer according to claim 1 wherein said spring means comprises heat-sensitive means to compensate for temperature variations by reducing the volume of the chamber when the temperature increases.

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4,336,905

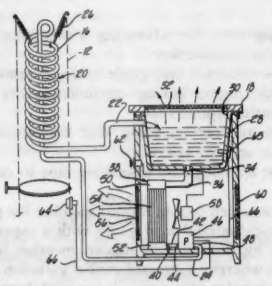
## HEAT RECOVERY SYSTEM

James C. Langs, 3585 Dorothy La., Waterford, Mich. 48095

Filed Jul. 17, 1980, Ser. No. 169,788

Int. Cl.³ F24D *3/00*

U.S. Cl. 237—8 R 8 Claims



1. For use in conjunction with a fireplace means having a flue, a heating system comprising:

a heat collector comprising fluid conduit means having an inlet and an outlet and means for mounting a portion of said fluid conduit means in the flue;

a housing;

a tank having an inlet and an outlet, said tank being positioned in said housing, said conduit outlet being connected to said tank inlet;

heat exchanger means having an inlet and an outlet, said heat exchanger means outlet being connected to said conduit means inlet;

means for fluidly connecting said tank outlet to said heat exchanger means inlet;

means for pumping a fluid through said conduit means;

fan means for moving air through said heat exchanger means and exteriorly of said housing;

said tank having an open top; and

said housing including means for establishing substantially

unrestricted fluid communication between the open top of the tank and exteriorly of the housing.

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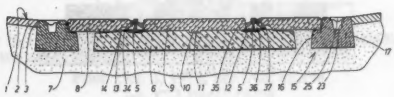
4,336,906

## ARRANGEMENT BY CROSSINGS BETWEEN ROADS AND RAILWAYS

Sten Limmergard, Humlaryd, Sweden, assignor to A-Betong AB, Sweden

Filed Dec. 20, 1979, Ser. No. 105,629
Claims priority, application Sweden, Dec. 20, 1978, 7813091
Int. Cl.[3] E01B *21/02*
U.S. Cl. 238—8 5 Claims



1. Arrangement for crossings between a road and a railway, where the road structure has two edges, between which is positioned at least one railroad track, the arrangement comprising two rails supported by a row of sleepers arranged substantially perpendicular to the rails, said sleepers resting on a foundation, outer slabs deposited in the area between the rails and the respective edges of the road structure, and a center slab, preferably divided up into sections in the longitudinal direction of the track and positioned between the rails forming the railroad track, said slabs having their top surfaces level with the top surfaces of the rails and the top surface of the road structure, and elongated supporting elements extending along said edges of the road structure each comprising in combination a bottom surface resting on the foundation, a first side edge facing the road structure and forming a support for the same, a first upper surface connected to said first side edge, a second upper surface positioned at a distance from the first upper surface, which is substantially level with the first upper surface, a groove between the first and second upper surfaces and extending along the supporting element, said groove being open in the upper surfaces and forming a water outflow, and a second side edge opposite to the first side edge forming a support for the outer edge of the respective outer slab, so that the elongated supporting element forms a support for the road structure, a base surface level with the road and the outer slab, a support for the outer slab and a water outflow for water preferably from the road.

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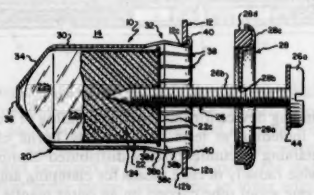
4,336,907

## APPARATUS FOR SUPPLYING CORROSION INHIBITING MATERIAL TO INACCESSIBLE METAL SURFACES

Richard D. Cummins, 6092 Emerson Dr., Orchard Park, N.Y. 14127

Filed Dec. 8, 1980, Ser. No. 213,812
Int. Cl.[3] A61L *9/04*
U.S. Cl. 239—57 7 Claims



1. An apparatus for applying corrosive inhibiting material to inaccessible metal surfaces via an access opening formed in a panel having outer and inner surfaces, said apparatus comprising in combination;

a cup-shaped retainer having a discharge opening and a mounting rim portion, said retainer being inserted inwardly through said access opening to position said discharge opening inwardly beyond said inner surface and said mounting rim portion being fixed to said panel peripherally of said access opening;

a disposable cartridge for containing a charge of corrosive inhibiting material and sized to be removably inserted within said retainer;

a sealing disc sized to engage said outer surface of said panel peripherally of said access opening; and

a mounting screw removably threadably received by said retainer for releasably clamping said sealing disc against said outer surface of said panel and for puncturing said cartridge to permit escape of contents therefrom into said retainer and outwardly thereof through said discharge opening.

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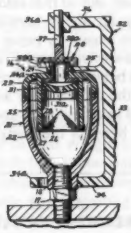
4,336,908

## IRRIGATION SYSTEM AND VOLUME CONTROL VALVE THEREFOR

Merle A. Vikre, 32 Windward Way, New Port Richey, Fla. 33552

Division of Ser. No. 971,038, Dec. 19, 1978, Pat. No. 4,231,523, which is a continuation-in-part of Ser. No. 765,266, Feb. 3, 1977, abandoned. This application Jul. 31, 1980, Ser. No. 174,196
Int. Cl.[3] A01G *25/09*; B05B *1/26, 1/30*
U.S. Cl. 239—177 27 Claims



1. Apparatus for uniformly irrigating a field, comprising:

(a) longitudinal conduit means having one end pivotally connected to a stationary point in the field and arranged for connection to a source of water under pressure;

(b) means for moving the longitudinal conduit means through the field as a rotating sweep arm relative to the stationary point;

(c) a plurality of spray head devices spaced over the length of the longitudinal conduit means, each in fluid communication with the longitudinal conduit means and constructed to deliver a predetermined volume of water onto an underlying area of the field as the longitudinal conduit means sweeps through the field;

(d) each spray head device having a water distributing capacity which is selected as a function of its radial position on the longitudinal conduit means and the size of its associated underlying area, and comprising

(i) enclosed housing means defining an internal chamber, a fluid inlet adapted for connection to said longitudinal conduit means for receiving water into the chamber, and an outlet constructed and arranged to issue a jet of water therefrom;

(ii) volume control means disposed in the internal chamber for controlling the jet of water so that the volume output from the outlet is substantially constant;

(iii) water deflecting means disposed for impingement by the jet of water and constructed to deflect the water outward into a predetermined flow pattern;

(iv) and frame means associated with the housing means for carrying the water deflecting means in overlying relation to the outlet.

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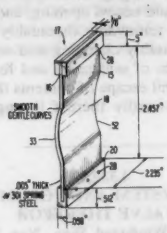
4,336,909
OSCILLATING REED AND METHOD
Ronald D. Stouffer, Silver Spring, Md., assignor to Bowles Fluidics Corporation, Silver Spring, Md.
Filed Feb. 8, 1980, Ser. No. 119,699
Int. Cl.³ B05C 5/04; B60H 1/14
U.S. Cl. 239—381 6 Claims



1. In an air flow system having a source of air under pressure flowing through a channel to an outlet element to issure as a sweeping air stream pattern, a resilient vane oscillator element having an upstream end and a downstream end, means securing said downstream end to said outlet element in fixed relation relative to said upstream end so that said upstream end is freely oscillatable, solely by air flow, between a pair of extreme positions, said extreme positions being spaced from the wall surfaces defining said outlet element and said channel, and means for limiting the bending of said resilient vane element to an axis transverse to the direction of air flow; said means for limiting the bending of said resilient vane element being constituted by at least one bend in the body of said resilient vane element.

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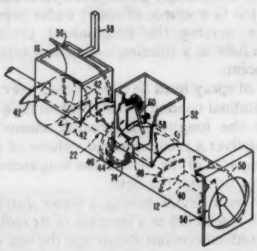
4,336,910
MILLING APPARATUS
Carl Judson, Jr., Rte. 2, Livermore, Colo. 80536
Filed Sep. 8, 1980, Ser. No. 184,769
Int. Cl.³ B02C 23/02
U.S. Cl. 241—246 6 Claims



1. Milling apparatus comprising:
an enclosure within which a solidifiable material is received;
mixing means disposed within said enclosure for effecting comminution and blending of said material and ultimate delivery of said material out of said enclosure;
a chamber disposed adjacent to said enclosure;
means for inducing a negative pressure within said chamber;
means defining a port communicating between said chamber and said enclosure;
and means movable within said port, in correlation with operation of said mixing means, for agitating portions of said material tending to lodge within said port.

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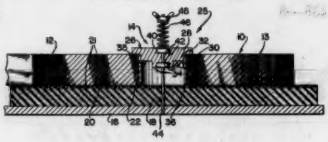
4,336,911
FRICTIONAL TENSIONING DEVICE
Wayne K. Fairchild, 3620 W. Pendleton Ave., Santa Ana, Calif. 92704
Filed Sep. 22, 1980, Ser. No. 189,153
Int. Cl.³ B65H 23/06, 59/16
U.S. Cl. 242—75.4 8 Claims



1. A frictional tensioning device in combination with a spool of tape or ribbon, to provide a constant frictional tension on said spool as the diameter thereof is reduced during the dispensing of the tape or ribbon, said device comprising:
a spool of tape having a central core on which said tape is coiled;
a fixed structure for mounting said device and said spool;
a resilient base member secured to said fixed structure;
a low-frictional surface formed on or mounted to the surface of said resilient base member, and arranged to frictionally engage the surface of said spool defined by said coiled tape;
a flexible plate interposed between said spool and said low-frictional surface, whereby said spool and said plate are engaged to rotate together about said low-frictional surface; and
means for biasingly securing said spool to said fixed structure, to engage said low-frictional surface of said flexible plate under a constantly even pressure.

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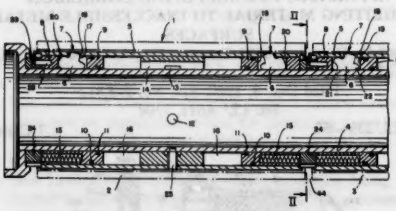
4,336,912
WINDING DEVICE
Manfred Greb, Huckeswagen, Fed. Rep. of Germany, assignor to Barmag Barmer Maschinenfabrik AG, Remscheid, Fed. Rep. of Germany
Filed Apr. 10, 1980, Ser. No. 139,095
Claims priority, application Fed. Rep. of Germany, Apr. 12, 1979, 2914923
Int. Cl.³ B65H 54/54, 65/00, 75/28
U.S. Cl. 242—46.4 20 Claims



1. In a winding device for the loss-free winding of a continuous thread including at least one turnably borne chucking spindle containing circumferentially distributed clamping elements movable radially in cage means for clamping and releasing at least one spool tube carried on an outer mantle shell of said spindle, spacer means for fixing each spool tube position, and thread catching and holding means for catching and securing a thread on the spool tube during thread transfer at the

beginning of the winding on said tube, said thread holding means being releasable for drawing off the wound spool tube, the improvement which comprises:

at least one cage means movable on the chucking spindle to direct said tube clamping elements radially outwardly and inwardly between a clamping position and releasing position, respectively; and

linking means operatively connecting the thread holding means with said cage means to synchronize the securing and releasing movements of the thread holding means with the clamping and releasing movements of said clamping elements for the spool tube.

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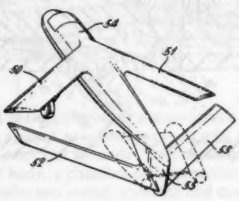
4,336,913

## COMPOUND WING AIRCRAFT

Eric B. Hall, 135, Spring Grove Crescent, Hounslow Middlesex TW3 4DA, England

Filed Oct. 2, 1979, Ser. No. 81,198
Int. Cl.³ B64C 39/08
U.S. Cl. 244—45 R 2 Claims



1. A compound wing powered aircraft comprising a fuselage, a downwardly-directed ventral fin in the region of the rear end of the fuselage, a swept-back anhedral foreplane and a forward-swept dihedral aftplane of at least approximately equal area to the foreplane, each of said foreplane and aftplane comprising wings with leading and trailing edges and tips at their outer extremities, the foreplane wings extending from opposite sides of the fuselage, the aftplane wings extending from opposite sides of the ventral fin at a position spaced from the fuselage, the wing tips of the foreplane being above, unconnected with and separated from the wing tips of the aftplane and the wing tips of the aftplane terminating to the rear of the trailing edges of the foreplane wings.

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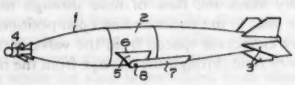
4,336,914

## DEPLOYABLE WING MECHANISM

Keith D. Thomson, Hawthorn, Australia, assignor to The Commonwealth of Australia, Canberra, Australia

Filed Dec. 11, 1979, Ser. No. 102,981
Claims priority, application Australia, Dec. 29, 1979, PD 7238
Int. Cl.³ B64C 3/40
U.S. Cl. 244—46 17 Claims



1. A deployable wing assembly for airborne missiles, aircraft or marine devices which comprise a body having wings thereon, each comprising an inner and an outer wing segment connected together to be generally co-extensive when deployed, and arranged to be stowed against the said body, and having first hinge means connecting an inner edge portion of the said inner wing segment to said body along a generally longitudinally disposed axis on the said body, and second hinge means connecting the outer wing segment to an edge portion of the said inner segment remote from the said first hinge means, said second hinge means being disposed generally at right angles to the surface of the said inner and outer wing segments at the said second hinge means, characterized in that the inner segment chord is large enough for the outer hinge to be in such a position as to permit efficient aerodynamic fairing, further characterized in that the said outer wing segment is long relative to the said inner wing segment and projects substantially beyond the inner wing segment whereby the wing segments can be given a large extension with high aspect ratio and good aerodynamic efficiency, further characterized by means to move and hold said inner wing segment angularly about the said first hinge means in relation to the said body, and means to move and hold said outer wing segment angularly about the said second hinge means in relation to the said first wing segment, whereby both wing segments can lie adjacent the said body with the inner or outer part of the wing segment extending beyond the inner wing segment, or can be deployed to selected positions.

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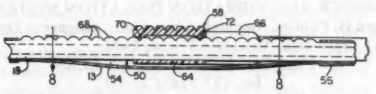
4,336,915

## CONSTRUCTION FOR WHISTLING AND SPARKLING KEEL KITE

Carl E. Stoecklin, 2996 Wardall Ave., Apt. 10, Cincinnati, Ohio 45211, and John F. Stoecklin, 2717 Erlene Dr., Cincinnati, Ohio 45238

Continuation-in-part of Ser. No. 123,384, Feb. 21, 1980, abandoned. This application Apr. 14, 1980, Ser. No. 139,992
Int. Cl.³ B64C 31/06
U.S. Cl. 244—153 R 6 Claims



1. A kite which comprises a pair of wing sticks, a body of sheet material secured to said wing sticks, a pair of brackets, means for mounting each bracket on one of the wing sticks for sliding therealong, a cross brace telescopically mounted in and connecting the brackets, the mounting means including first ratchet means on the bracket and second ratchet means on the associated wing stick, interengagement between the first and second ratchet means releasably holding the brackets at selected positions along the wing sticks, keel means mounted on the body between the wing sticks, and means for attaching a kite string to the keel means.

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4,336,916

## STAND FOR SUPPORTING A HAND-HELD IMPLEMENT

Floyd W. Blanchard, 2231 Earl St., Los Angeles, Calif. 90039

Division of Ser. No. 24,267, Mar. 27, 1979. This application May 4, 1981, Ser. No. 259,989
Int. Cl.³ A47F 7/14
U.S. Cl. 248—471 4 Claims

1. In combination, a stand and hand-held implement, comprising:

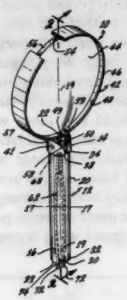
an elongated grip portion sized to fit comfortably in a user's hand, said elongated grip portion including upper and lower ends, major and minor axes and opposite sides diverging a predetermined amount with respect to each other;

an instrument affixed to said upper end of said elongated grip portion;

first and second L-shaped grooves provided on said first and second divergent sides, respectively, of said grip portion, each of said grooves having a long leg extending from said lower end of said grip portion to a point adjacent the upper end thereof and a short leg extending along said lower end of said grip portion normal to said long leg, said

short legs lying in diverging vertical planes defined by said diverging sides;

a pair of support members each having major and minor axes; and



first and second pivot pins swingably connecting one end of each support member to an associated one of said short legs at the intersection with its long leg, whereby each of said support members may be swung from a convergent, nested position in the long leg ot its groove to a divergent position in the short leg of its groove.

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**4,336,917**

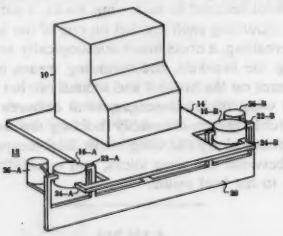
**SHOCK AND VIBRATION ISOLATION SYSTEM**

**Edward H. Phillips, Mountain View, Calif., assignor to Optimetrix Corporation, Mountain Viwew, Calif.**

**Filed Oct. 11, 1979, Ser. No. 83,769**

**Int. Cl.³ F16M *13/00***

**U.S. Cl. 248—550** **24 Claims**



1. A shock and vibration isolation device comprising:

a frame member;

a first mounting member coupled to the frame member;

a second mounting member coupled to the frame member and pendulously supported by the frame member from the first mounting member, thereby allowing movement of the second mounting member with respect to the first mounting member along first and second axes;

gas actuable displacement means coupled to the frame member and at least one of the first and second mounting members for changing the distance between the first and second mounting members along a third axis;

sensor means coupled to the first and second mounting members for sensing and producing a signal indicative of the relative separation between the first and second mounting members; and

gas supply control means including accumulator means coupled to the gas actuable displacement means and to the sensor means for supplying pressurized gas to the gas actuable displacement means to maintain the relative separation between the first and second mounting members constant and to damp relative motion between the first and second mounting members.

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**4,336,918**

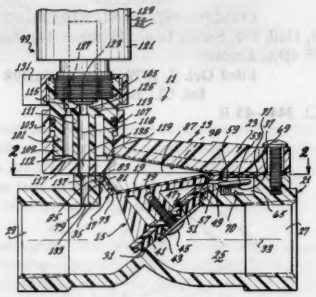
**DIAPHRAGM VALVE WITH MULTIPLE PIVOT AXIS VALVE ELEMENT**

**Richard S. Karbo, Newport Beach, Calif., assignor to Hydro-Rain, Inc., Laguna Niguel, Calif.**

**Continuation-in-part of Ser. No. 100,935, Dec. 6, 1979, Pat. No. 4,301,992. This application Oct. 27, 1980, Ser. No. 198,122**

**Int. Cl.³ F16K *31/12, 25/00***

**U.S. Cl. 251—46** **18 Claims**



1. A valve comprising:

a valve housing having a passage extending therethrough, said passage having an inlet and an outlet and a longitudinal axis, said housing having a valve seat in said passage, said valve seat defining a plane which forms an acute angle with said axis, and said valve housing having a cavity communicating with said passage;

a movable diaphragm extending across said cavity to define a control chamber on one side of the diaphragm, the other side of the diaphragm communicating with the passage;

control means for varying the pressure in the control chamber to tend to control the position of the diaphragm, said control means including passage means in said valve housing leading to said control chamber;

a diaphragm support having an opening therein;

means for mounting said diaphragm support so that the diaphragm support can at least partially support the diaphragm on said other side of the diaphragm in a predetermined position of the diaphragm;

a valve element;

means for pivotally mounting the valve element on the valve housing for pivotal movement about a primary pivot axis relative to said diaphragm support between a closed position in which the valve element engages the valve seat to essentially block the flow of fluid through the passage from the inlet to the outlet and an open position in which the valve element is spaced from the valve seat to allow the flow of fluid through the passage from the inlet to the outlet;

means for mounting the valve element for pivotal movement about a secondary pivot axis with movement of the valve element about the secondary pivot axis adjusting the position of the valve element to permit the valve element to more tightly seat against the valve seat; and

said diaphragm acting through said opening in said diaphragm support to urge the valve element toward the closed position when the pressure in the control chamber is sufficient and said valve element being movable to said open position by fluid from the inlet acting on said valve element when the pressure in the control chamber is reduced by said control means.

4,336,919

## BALL VALVE

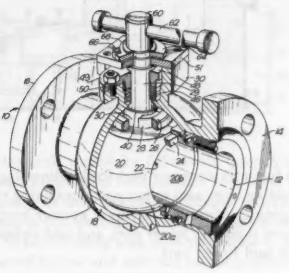
Alan D. Hall, Brighouse, England, assignor to Lake & Elliot Incorporated, Wilmington, Del.

Filed Jan. 10, 1980, Ser. No. 111,162

Claims priority, application United Kingdom, Sep. 26, 1979, 7933390

Int. Cl.³ F16K 5/06

U.S. Cl. 251—214 3 Claims



1. A ball valve comprising a single-piece body having a first axis and a second axis transverse to said first axis, the body having an inlet and an outlet opening aligned along said first axis of said body, a chamber defined within said body intermediate said inlet and outlet openings and communicating therewith, a ball-shaped valve member disposed in said chamber and having a passage extending therethrough, means supporting said valve member for rotation in said chamber, about said second axis of said body, between a position in which said passage extends in alignment with said inlet and outlet openings along said first axis and a position in which said passage extends transversely to said first axis and said valve member cuts off said inlet opening from said outlet opening, the valve further including an operating stem for said valve member, a stem passage being formed through said body along said second axis, means mounting said stem for rotation in said body about said second axis, interengaging coupling means on said stem and said valve member entraining said valve member for rotation with said stem, abutment means on said stem for preventing, by engagement with abutment means on said body, removal of said stem from said body by movement of the stem axially from the body along said second axis, said stem, from said abutment means thereon to the end of the stem outside the body, being of a size to pass along the stem passage past said abutment means on said body, whereby in assembly of the valve said stem can be fitted into said stem passage by passing the stem through one of said openings into said chamber and extending the stem through said stem passage from the interior of said chamber, the valve further including sealing means for sealing said valve stem with respect to the body, said sealing means being disposed on the side of said abutment further from said chamber and being accessible from the exterior of said body whereby, in use, said sealing means can be replaced without disconnecting the valve body from any associated pipe fittings while the stem is prevented from blowing out of the valve body by said abutment means on the stem and body, said body having a bore therein defining part of said stem passage, the ball valve further comprising a bearing element having a bore therethrough aligned with said bore in said body, and means securing said bearing element detachably to said body, and wherein said means mounting said stem for rotation in said body about said second axis includes a first bearing formed by said bore in said body, and a second bearing formed by said bore in said bearing element, and wherein said body has a surface onto which said bore in said body opens and which surface faces towards said valve member, said abutment means on said body being afforded by said surface having a bore therethrough affording a first bearing, said stem having first and second journals respectively received in said first and second bearings respectively, said second bearing being disposed further from said chamber and from said abutment means on said stem than said first bearing, said stem on the side of said first journal remote from said abutment means having a size to pass through said second bearing whereby after detachment of said bearing element from said body the bearing element can be withdrawn from the stem over the end of the latter remote from said chamber and said valve member, said sealing means being disposed between said bearing element and said bearing formed in said body, wherein said bearing element includes a shoulder facing along said second axis towards said chamber, and said stem includes a shoulder facing away from said chamber along said second axis, and the ball valve further comprising thrust bearing means serving to limit movement of said stem along said second axis away from said chamber to a position in which a separation is maintained between said abutment means on the stem and said body, said thrust bearing means including said shoulders, wherein said detachable bearing element comprises a central portion affording said second bearing and respective end portions extending in opposite radial directions away from said central portion, and wherein said body has two pillar members extending on opppsite lateral sides of said stem in substantially the same direction as that in which said stem extends, means mounting a respective said end portion of said bearing element on a respective said pillar, and wherein said sealing means includes a packing chamber surrounding said stem and forming part of said stem passage, packing disposed in said packing chamber, a gland around said stem defining an end of the packing chamber further from said valve member than the other end of the packing chamber, said gland including a central portion having an aperture through which said stem extends, and further including two arms extending in opposite radial directions from said central portion, each said arm extending through a respective one of the two openings defined on either side of the spindle between the two pillars, the valve body and the bearing element, and screw-down means connecting each said arm at its end projecting beyond the pillars and the bearing element, with the valve body, whereby said screw-down means is accessible from the exterior of the valve while said detachable bearing element is still secured to said body, so that the said screw-down means can be operated, without disturbing the detachable bearing element, to draw said gland towards said valve member along said second axis to compress said packing.

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4,336,920

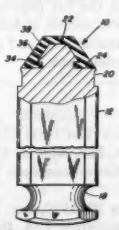
## VALVE ELEMENT WITH MOLDED RESILIENT TIP AND METHOD OF MAKING SAME

Myles N. Murray, Chagrin Falls, Ohio, assignor to Industrial Electronic Rubber Company, Twinsburg, Ohio

Filed Jul. 2, 1980, Ser. No. 165,299

Int. Cl.³ F16K 51/00; B29D 3/00; B29F 1/00

U.S. Cl. 251—357 9 Claims



1. A method of forming a resilient tip valve element, comprising the steps of:

(a) providing an open mouth mold having therein an annular crimp wall defining the open end of a mold cavity;

(b) providing a valve body having at one end thereof a cylindrical neck having an end face and an outer diameter not greater than the inner diameter of the crimp wall and a small annular crimp bead projecting radially outwardly from the neck at the end face and having an outer diameter greater than that of the crimp wall;

(c) closing the open end of the mold cavity by axially aligning and urging the body into the mold with the crimp bead engaging the crimp wall and crimping the bead thereby to effect a tight annular seal around the neck at the end face thereby to form a closed cavity defined by the cavity wall and end face; and

(d) filling the thusly closed cavity with fluid material and curing same to form the resilient tip.

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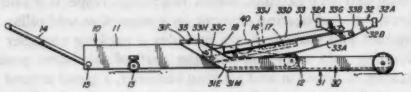
## 4,336,921
## JACK EXTENSION

**Edgar K. Wienhold, 1100 Lamar Dr., Kamloops, B.C., Canada V2C 5C4**

**Filed Mar. 13, 1981, Ser. No. 243,461**
**Claims priority, application Canada, Mar. 6, 1981, 372441**
**Int. Cl.³ B66F *5/00***
**U.S. Cl. 254—8 B** **1 Claim**



1. A portable lift jack comprising a wheeled trolley jack and a wheeled attachment therefor extending the jacking range thereof said attachment comprising:

(a) an elongate low profile rigid frame having a tunnel extending inwardly from one end thereof in a direction toward the other and open downwardly receiving the jacking end portion of the trolley type service jack when rolled thereinto, downwardly directed upper abutment means on said frame, adjacent the entry to the tunnel, engaging a rigid frame portion of the trolley track and bearing downwardly thereon at a position spaced rearwardly from the forward end of the jack, upwardly directed lower abutment means adjacent the inner end of the tunnel providing a support for the forward end portion of the trolley jack;

(b) a lift platform having an upper load supporting surface disposed in a substantially horizontal plane at a position forwardly beyond the forward end of the trolley jack; and

(c) lever means pivotally attached to the lift platform and rigid frame, in a parallelogram arrangement, mounting the lift platform on the frame for movement relative thereto such that said load supporting surface automatically remains horizontal during raising and lowering of the same, said lever means overlying said tunnel and extending therebeyond with the lift platform located at the outer free end of the lever means, at least one lever of said lever means being engagable with and pivotally movable by the lift part of the trolley jack.

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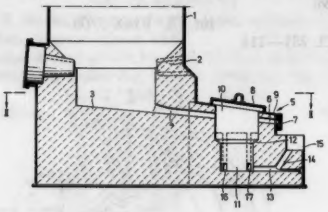
## 4,336,922
## CONTINUOUSLY TAPPED CUPOLA FURNACE

**Karl Immekus, Kaarst, Fed. Rep. of Germany, assignor to Gesellschaft für Hüttenwerksanlagen mbH, Duesseldorf, Fed. Rep. of Germany**

**Filed May 29, 1980, Ser. No. 154,366**
**Claims priority, application Fed. Rep. of Germany, Jun. 8, 1979, 2923221**
**Int. Cl.³ C21B *3/04***
**U.S. Cl. 266—227** **13 Claims**

1. In a continuously tapped cupola furnace including an inclined furnace bottom, a forehearth located laterally from the inclined furnace bottom, a tapping conduit extending between and communicating said furnace bottom with said forehearth and having an inlet end at the furnace bottom and an outlet end in said forehearth, and siphons for discharging iron and slag from said forehearth, the improvement wherein said



forehearth includes an upper part for holding slag and a lower part for holding iron, said upper part containing the outlet end of said tipping conduit and having a greater horizontal cross-sectional area than said lower part, and said siphons communicating with said lower part.

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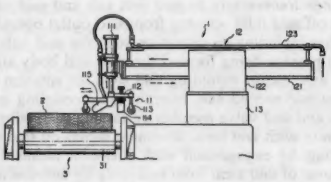
## 4,336,923
## STEEL SURFACE INSPECTION APPARATUS

**Toshio Shiraiwa, Ikoma; Tatsuo Hiroshima, Nishinomiya, and Takahide Sakamoto, Minoo, all of Japan, assignors to Sumitomo Metal Industries, Ltd., Osaka, Japan**

**PCT No. PCT/JP79/00134, § 371 Date Apr. 10, 1980, § 102(e) Date Apr. 10, 1980, PCT Pub. No. WO80/02667, PCT Pub. Date Dec. 11, 1980**
**PCT Filed May 25, 1979, Ser. No. 262,066**
**Int. Cl.³ B23K *7/08***
**U.S. Cl. 266—51** **2 Claims**



1. A steel surface inspection apparatus, comprising:

a detection head including a detector probe and a scarfing torch;

a drive mechanism for moving said detection head for scanning along a predetermined path; and

a control device for controlling operation of said detection head and said drive mechanism, said apparatus being characterized in that said scarfing torch is disposed forwardly of said detector probe with respect to the scanning direction of said detector head, the surface of the path to be scanned by said head is scarfed smooth before flaw detection by said scarfing torch, and after the flaw detection surface defects are scarfed away by said scarfing torch according to the results of the flaw detection.

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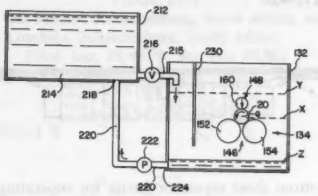
## 4,336,924
## APPARATUS FOR QUENCHING HEATED WORKPIECES

**Paul L. Day, Parma, Ohio, assignor to Park-Ohio Industries, Inc., Cleveland, Ohio**

**Filed Jan. 21, 1980, Ser. No. 113,691**
**Int. Cl.³ C21D *1/64***
**U.S. Cl. 266—117** **7 Claims**

1. An apparatus for quenching a heated elongated workpiece

having a central axis and spaced ends comprising a quench tank having liquid containing sides and bottom, means mounting said workpiece to rotate about said axis at a selected position in said quench tank, means for rotating said workpiece about said central axis, means for restraining transverse deflection of said workpiece while said workpiece rotates, an inter-




mittent holding tank, means for filling said quench tank with a quenching liquid from said holding tank to a level above said selected position as said heated, restrained workpiece is rotated, and means for forcing said quenching liquid from said quench tank to said holding tank until said liquid in said quench tank is at a level below said selected position after said workpiece is quenched.

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**4,336,925**

## DEVICE FOR FIXING AND SEALING STAVE PLATES FOR A BLAST FURNACE

**Pierre H. Rollot; Jean A. Cordier, both of Dunkerque, and Raymond L. Briche, Thionville, all of France, assignors to Technilor, Hagondange and Usinor, Paris, both of, France**

**Filed Jun. 5, 1980, Ser. No. 156,623**
**Claims priority, application France, Jun. 6, 1979, 79 15074**
**Int. Cl.³ C21B *7/10***
**U.S. Cl. 266—193** **6 Claims**

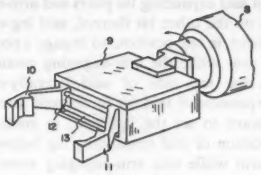
1. In a blast furnace comprising an armour shell, stave plates disposed in superimposed rings adjacent an inner face of the shell, said stave plates each having an inner cooling fluid circulating tube which extends out of upper and lower parts of the stave plate inside respective protecting sleeves, said tubes extending through orifices provided in the shell; the improvement wherein, for the purpose of fixing and sealing the stave plates, in said lower parts of the stave plates, the protecting sleeves are extended through the shell, and a washer is welded to each sleeve in said lower part and to the shell for fixing the sleeve, said washers welded to the sleeves constituting an assembly which both fixes the stave plates and maintains under compression between the stave plates and the inner face of the shell a continuous sealing belt, which belt comprises a juxtaposition of substantially rectangular joint elements, preformed of a silicone elastomer by molding, each of which joint elements comprises in a lower part thereof a heel which is engaged and gripped between the plate on which it is mounted and an upper part of a stave plate located immediately therebelow each of which joint elements substantially fits the shape of said lower part of the corresponding stave plate and defines an aperture for the passage of a corresponding sleeve and, in said upper parts of the stave plates, the sleeves are also extended out of the shell and a cup-shaped ring is welded both to each sleeve in said upper part and to the shell and forms an assembly which constitutes means both for fixing the stave plates to the shell and for maintaining under compression between the stave plates and the inner face of the shell substantially circular flat joint elements each of which joint elements surrounds a corresponding sleeve of said upper part of the stave plates.

**4,336,926**

## WORKPIECE MANIPULATOR

**Shigemi Inagaki, and Ryo Nihei, both of Musashino, Japan, assignors to Fujitsu Fanuc Limited, Tokyo, Japan**

**Filed Jun. 25, 1980, Ser. No. 162,879**
**Claims priority, application Japan, Jun. 30, 1979, 54-082780**
**Int. Cl.³ B23Q *3/08***
**U.S. Cl. 269—34** **5 Claims**




1. A workpiece manipulator, comprising:
first and second fingers;
means mounting said first and second fingers for movement toward and away from each other to respectively grip and release said workpiece;
two spaced-apart, rotatable pulley members;
a belt member stretched between said pulley members in the form of an endless loop having first and second linear segments which lie in parallel;
means for coupling said first finger to the first linear segment of said belt member;
means for coupling said second finger to the second linear segment of said belt member; and
driving member means for rotating said belt member, said driving member means being operatively connected to one of the first and second linear segments, wherein said driving member means comprises
a cylinder having two end walls, said cylinder being connected to one of said first and second linear segments of said belt member,
a piston having two sides disposed within said cylinder,
first and second piston rods each having one end fixedly secured to said piston on either side thereof, the other ends of said first and second piston rods passing hermetically through both end walls of said cylinder and being fixedly secured outside of said cylinder such that said first and second piston rods will not move, and
means for moving said cylinder by introducing a fluid into said cylinder, thereby to move said first and second fingers.

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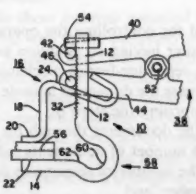
**4,336,927**

## LIGHT-WEIGHT JAM-CLAMP AND COMBINATION

**Otis W. Goff, 5221 Woodmont Dr., Kalamazoo, Mich. 49001, and Melvin J. Goff, 2454 52nd, SW., Wyoming, Mich. 49509**

**Filed May 8, 1980, Ser. No. 148,188**
**Int. Cl.³ B25B *5/02***
**U.S. Cl. 269—171.5** **22 Claims**




1. A light-weight jam-clamp combination comprising clamping faces adapted to be held in clamping position by releasably jamming one element of the clamp against another element

thereof in combination with jamming and releasing means separable from said elements, whereby said clamp is unencumbered by said jamming and releasing means while said clamp is functioning as a clamp, in which said jamming and releasing means comprises an expansion bit pliers means, and in which one of said elements is an upstanding leg and the other is a laterally-extending arm adapted to fit over and jam against said upstanding leg, and in which leg-engaging means is provided on one bit of said expanding bit pliers and arm-engaging means is provided on the other bit thereof, said leg-engaging means being operative, in one position, to engage a portion of said leg above said arm while the arm-engaging means is in engagement with the top side of said laterally-extending arm, whereby expansion of said bit forces said laterally-extending arm downward to set the jam and, in another position, to engage a portion of said upstanding leg below said laterally-extending arm while said arm-engaging means is in engagement with the underside of said laterally-extending arm, whereby expansion of said bit forces said laterally-extending arm upward to release the jam.

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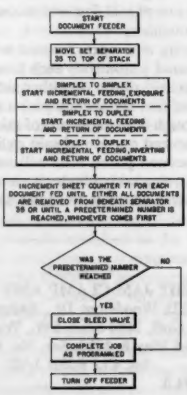
4,336,928

## METHOD FOR FEEDING DOCUMENTS TO A COPY MACHINE

**Richard E. Smith, Webster; Stephen J. Wenthe, Jr., Rochester, and William J. Woznicki, Ontario, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.**

**Filed Aug. 4, 1980, Ser. No. 174,789**
**Int. Cl.³ B65H *3/08, 43/00***
**U.S. Cl. 271—3.1** **5 Claims**


START DOCUMENT FEEDER
MOVE SET SEPARATOR 35 TO TOP OF STACK
SIMPLEX TO SIMPLEX START INCREMENTAL FEEDING, EXPOSURE AND RETURN OF DOCUMENTS
SIMPLEX TO DUPLEX START INCREMENTAL FEEDING AND RETURN OF DOCUMENTS
DUPLEX TO DUPLEX START INCREMENTAL FEEDING, INVERTING AND RETURN OF DOCUMENTS
INCREMENT SHEET COUNTER 71 FOR EACH DOCUMENT FED UNTIL EITHER ALL DOCUMENTS ARE REMOVED FROM BENEATH SEPARATOR 35 OR UNTIL A PREDETERMINED NUMBER IS REACHED, WHICHEVER COMES FIRST
WAS THE PREDETERMINED NUMBER REACHED
NO
YES
CLOSE BLEED VALVE
COMPLETE JOB AS PROGRAMMED
TURN OFF FEEDER

1. A method for controlling the operation of an automatic document handler having air flotation means associated with the document separator-feeder mechanism of the document handler to increase the document latitude of handling ability of the feeder comprising the steps of;

circulating the documents through the document handler,

counting the number of documents fed,

comparing the number of documents counted to a predetermined number, and

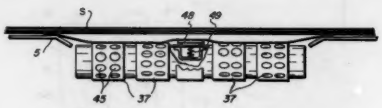
adjusting the quantity of air discharged from said air flotation means so that more air is discharged when said counted number is greater than said predetermined number.

4,336,929

## VARIABLE CORRUGATION VACUUM CORRUGATING SHEET FEEDER

**Edward W. C. Hanzlik, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.**

**Filed Aug. 4, 1980, Ser. No. 174,785**
**Int. Cl.³ B65H *3/12***
**U.S. Cl. 271—20** **6 Claims**




1. A bottom sheet separator-feeder for separating and forwarding sheets seriatim comprising:

a stack tray adapted for supporting a stack of sheets,

vacuum feed means associated with said tray spaced from the bottom of the sheets stacked therein, said vacuum feed means being adapted to separate the bottommost sheet from the remainder of the sheet stack and acquire the sheet thereon,

variable corrugating means associated with said vacuum sheet feed means adapted to hold the sheet acquired by the vacuum sheet feed means in a non-planar condition to provide a corrugation in the acquired sheet, said corrugating means including biasing means to bias said corrugating means toward the stack such that light weight sheets acquired by said vacuum feed means have insufficient beam strength to deflect said corrugating means away from the stack, thereby providing maximum corrugation in the sheet while heavy weight sheets, having a higher beam strength, are adapted to force said corrugating means away from the stack, thereby providing less corrugation to the sheet while at the same time allowing the sheet to more closely approach said vacuum feed means for adequate acquisition of the sheet thereon.

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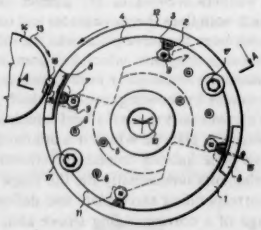
4,336,930

## SHEET TRANSFER ATTACHMENT

**Arnost Cerny, Blansko; Jiri Fiser, Adamov; Jaroslav Jiruse, Blansko, and Vaclav Sedlak, Jedovnice, all of Czechoslovakia, assignors to Adamovske strojirny, narodni podnik, Prague, Czechoslovakia**

**Filed Oct. 15, 1980, Ser. No. 197,188**
**Claims priority, application Czechoslovakia, Oct. 15, 1979, 6959-79**
**Int. Cl.³ B65H *29/06***
**U.S. Cl. 271—277** **2 Claims**



1. A sheet transfer device for printing machines having sheet turning means comprising a transfer drum having a transfer body, a reset drive gear wheel and paper gripping means and a turning drum having gears and paper gripping means wherein the reset gear wheel comprises a gear wheel adjustably mounted on eccentric pins rotatably mounted in a centering flange having eccentrics for centering the centering flange,

adjustably mounted in the centering flange, which bear against the transfer drum body and means for attaching the reset gear wheel to the transfer drum body.

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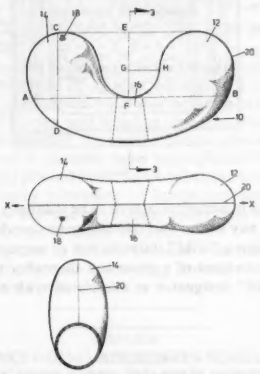
**4,336,931**
**POOL TOY**

**Renier J. van Staden, Johannesburg, South Africa, assignor to Charles Lonstein, Johannesburg, South Africa**

**Filed Aug. 15, 1979, Ser. No. 66,802**
**Claims priority, application South Africa, Aug. 16, 1978, 78/4646**
**Int. Cl.³ A63G *31/00***
**U.S. Cl. 272—1 B** **9 Claims**



**1.** A pool toy comprising a buoyant body of a substantially U-shaped outline with a center part and end parts, said center part being narrower than said end parts, the center part defining a seat for a rider and the end parts being bulbous in shape in both side and plan views, said end parts forming buoyant portions on opposite sides of said seat, the end parts being raised and normally divergent and in a self-sustaining condition with respect to the center part, each being of greater volume than the center part of the body, said body having a lower portion convexly curved in more than one direction and said body being symmetrical about its central longitudinal plane and its central transverse plane, whereby said pool toy resists tipping in the backwards, forwards and sideward directions as a result of the end parts resisting submersion.

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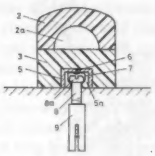
**4,336,932**
**EDGING FOR THE TRACK INSIDE OF A SPORTS INSTALLATION**

**Alfred Steiner, Andelfingen, Switzerland, assignor to Steiner Silidur A.G., Andelfingen, Switzerland**

**Filed Jan. 19, 1981, Ser. No. 226,673**
**Claims priority, application Fed. Rep. of Germany, Jan. 22, 1980, 8001491[U]**
**Int. Cl.³ A63K *1/00***
**U.S. Cl. 272—4** **3 Claims**

**1.** Edging for the track inside of a sports installation, which possesses an upper header body (2) composed of a plurality of individual sections (1) abutting at their interfaces, wherein each section at its lower side is connected to at least two spacer pieces (3) which rest on a foundation and are releasably connected thereto, characterized in that the spacer pieces (3) are made of an elastically resilient material, and that at their lower side an elongate carrier rail (5), inverted U-shaped in cross-section and open at its lower side, is inserted in a countersunk manner and is at least laterally enclosed by the material of the spacer pieces (3), and in the hollow space (5*a*) of which an approximately inverted U-shaped spring clip (7) is fastened, the



legs of which resiliently reach under the head (8*a*) of an attachment screw (8) or the like, inserted in a foundation.

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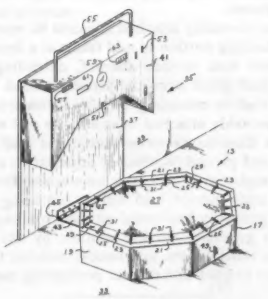
**4,336,933**
**REBOUND EXERCISE DEVICE FOR IN-PLACE JOGGING**

**Paul Appelbaum, P.O. Box 1477, Denver, Colo. 80150**

**Filed Mar. 30, 1981, Ser. No. 248,830**
**Int. Cl.³ A63B *23/04, 5/18***
**U.S. Cl. 272—70** **13 Claims**



**1.** Exercise apparatus for in-place jogging having a wall-mounted storage configuration and an in-use configuration on floor space adjacent the wall, comprising:

(a) a hollow, box-like metallic support frame, having a bottom wall that engages the floor when said apparatus is in its in-use configuration, and having a top wall with a central opening therein;

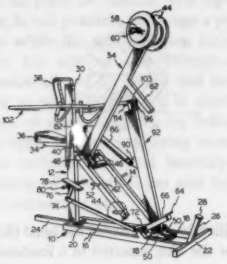
(b) a mat of flexible sheet material mounted in the central opening of said top wall to the periphery of said mat;

(c) a wall-mounted housing fixedly attached to the wall and having a lower portion which extends to the juncture of floor and wall, said housing being connected to said support frame by a connecting member which has a first end which is hinge-connected, about a horizontally extending axis, to the lower extremity of the lower portion of said housing and a second end which is hinge-connected, about a horizontally extending axis, to a lower portion of said support frame, said housing being adapted to receive and hold said support frame when said frame is rotated through about ninety degrees off the floor and to a storage configuration adjacent the wall.

## 4,336,934
## ROWING EXERCISE MACHINE

Michael W. Hanagan, Santa Cruz, Calif., and Donald I. Schoeck, Wolcott, Conn., assignors to Corbin Gentry, Inc., Somersville, Conn.

Filed Feb. 27, 1981, Ser. No. 238,807
Int. Cl.³ A63B 69/06, 21/08
U.S. Cl. 272—72 11 Claims



1. A rowing exercise machine comprising in combination:
a frame, including a base portion and an upstanding portion;
subject positioning means to said upstanding portion of said frame;
an upstanding effort arm pivotably attached adjacent its lower end to said base portion of said frame at a location spaced forwardly of said subject positioning means;
a handle member having a forward end portion pivotably attached adjacent the upper end of said effort arm and extending generally rearwardly toward said subject positioning means;
a weight bar pivotably attached adjacent its rearward end to said upstanding portion of said frame at a location spaced above said base portion thereof, extending forwardly beyond said effort arm and having means adjacent its forward end for mounting weights thereon; and
a tie rod pivotably attached adjacent one end to said effort arm at a location between said upper and lower ends thereof, and pivotably attached adjacent its opposite end to said weight bar at a location between said rearward and forward ends thereof, said weight bar being disposed at rest in a generally horizontal attitude, and being elevated toward a generally vertical attitude by the exertion of force rearwardly upon said handle member to pivot said effort arm toward said subject positioning means.

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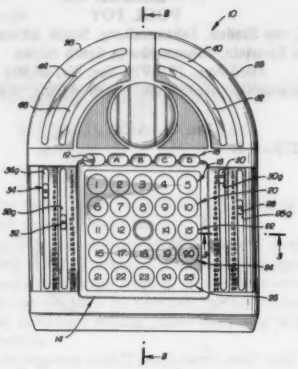
## 4,336,935
## MUSICAL GAME APPARATUS

Adolph E. Goldfarb, 4614 Monarca Dr., Tarzana, Calif. 91356

Filed Jan. 2, 1980, Ser. No. 109,091
Int. Cl.³ A63F 9/00
U.S. Cl. 273—1 E 12 Claims

1. A musical game apparatus comprising:
a. at least eight different tune select designators that may be manually selected by a player;
b. a mode selector for selecting at least a first mode and a second mode;
c. synthesis means for generating musical notes and making them audible to the player;
d. memory means for storing a plurality of pre-programmed sequences of musical notes;
e. control means operable in said first mode for associating at the start of a game particular ones of said stored sequences each with two of said designators and for causing, during each turn of play within a game, said synthesis means to play a first musical note sequence associated with the designator first selected by the player within said turn of play and then determining whether a second designator also selected within said turn of play is also associated with said first sequence, said control means being operable in said second mode for respectively causing at least eight different single musical notes to be played by said synthesis means upon the respective manual selection of eight different turn select designators, thereby permitting all



eight notes in a musical octave to be manually selected and played in any order, said control means randomly operating to assign a "wild" status to one or more of said designators at the start of a game and thereafter treating each such "wild" designator as associated with all of said sequences.

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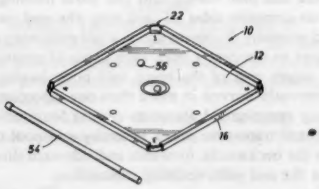
## 4,336,936
## PORTABLE GAME SURFACE FOR A POOL-LIKE GAME

Richard L. Young, 10266 Hammerly, Houston, Tex. 77043

Filed Jul. 14, 1980, Ser. No. 168,619
Int. Cl.³ A63D 13/00, 15/02
U.S. Cl. 273—2 6 Claims



1. Apparatus capable of forming a portable game surface on a flat support surface for a pool-like game in which movable objects are used, comprising:
a sheet of flexible material for forming the game surface;
a plurality of discrete structural elements capable of being connected to flexible material for defining the boundaries of the game surface and forming bumper rails for the movable objects;
first connecting means for connecting said structural elements lengthwise to said flexible material such that said flexible material covers the surface portion of said bumper rails contacted by the movable objects;
second connecting means for rigidly connecting adjacent ends of said structural elements to each other for forming the boundaries of the game surface and maintaining the game surface in playable form;
means forming pockets for the movable objects at locations where said bumper rails are joined;
said structural elements being capable of being manually disconnected from each other and from said sheet of

flexible material so that the game surface can easily be dismantled; and

each bumper rail includes a conduit with a generally rectangular cross-section.

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4,336,937

## HARDBOARD-BONDED MELAMINE OVERLAID SURFACE FOR BOWLING LANE

Peter B. Kelly, Pasadena, Tex., assignor to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 926,604, Jul. 21, 1978, Pat. No. 4,231,573, which is a division of Ser. No. 901,791, May 1, 1978, abandoned, which is a continuation of Ser. No. 506,069, Sep. 16, 1974, abandoned. This application Oct. 2, 1979, Ser. No. 81,216
The portion of the term of this patent subsequent to Nov. 4, 1997, has been disclaimed.

Int. Cl.³ A63D *1/04;* B32B *5/26, 5/30, 21/08*

U.S. Cl. 273—51 2 Claims

1. A bowling lane having a surface characterized by a falling ball impact resistance of at least 60 inches, a coefficient of friction of at least 0.16 and a Taber abrasion resistance of at least about 400 cycles, said bowling lane comprised of a melamine resin impregnated decorative fibrous printed sheet, not more than about 3 phenolic resin impregnated fibrous sheets underlaying said printed sheet, and a cellulosic board of at least 60 pounds density consisting of hardboard bonded to said underlay sheets and said print sheet under heat and pressures from about 1000 psi to about 1500 psi.

2. A bowling lane as defined in claim 1 further including at least one overlying resin containing protective layer of said decorative fibrous print sheet.

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4,336,938

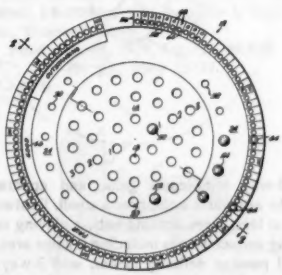
## GAME INCLUDING APERTURES SIMULATING PLAYING CARDS SELECTED BY A ROLLED BALL

Paul G. Laroche, Lauderdale By The Sea, Fla., assignor to Glenhope Enterprises, Inc., Fort Lauderdale, Fla.

Continuation of Ser. No. 61,825, Jul. 30, 1979, abandoned, which is a continuation-in-part of Ser. No. 911,430, Jun. 1, 1978, abandoned. This application Apr. 30, 1981, Ser. No. 259,002

Int. Cl.³ A63F *5/02*

U.S. Cl. 273—138 R 5 Claims



1. A game of chance including a smooth spherical ball having a predetermined diameter, said game of chance including:

a gameboard having a generally concavely dish-shaped play surface, and said gameboard play surface being generally circular and symmetrical with respect to a vertical centerline through the play surface,

said play surface having a smooth concave central zone free and clear of upstanding projections, and an outer peripheral zone about the central zone, said central zone being characterized by a first common radius of curvature having a center on the vertical centerline, said peripheral zone having a generally smooth surface defining a circular race path, said race path being free and clear of upstanding projections and said race path being characterized by a second common radius of curvature longer than said first radius of curvature, and said second radius of curvature having a center on the vertical centerline,

the central zone having a plurality of recesses arranged in a plurality of four rings of recesses, (a) an inner ring, (b) an outer ring, (c) a ring between said inner and outer rings and adjacent said inner ring, and (d) a ring between said inner and outer rings and adjacent said outer ring,

said inner ring being composed of six recesses, said outer ring being composed of 20 recesses, and said ring between said inner and outer ring and adjacent said inner ring being composed of 10 recesses, and said ring between said inner and outer ring and adjacent said outer ring being composed of 16 recesses,

each of the recesses having a predetermined common diameter less than the diameter of the ball and adpated to nestingly receive and releasably captivate the ball,

the recesses of each ring being equispaced from one another and said rings being equispaced from one another, and,

the portion of the central zone within the inner ring being an uninterrupted smooth concave surface, whereby when the ball, when rolled over the race path enters the central zone, will travel toward the portion of the central zone within the inner ring under the influence of gravity, to be received either in one of the plurality of recesses through random selection or come to rest in the portion of the central zone bounded by said inner ring,

an outer annular rim about the race path to constrain a ball traveling over the path to eventual movement under the influence of gravity toward the cental zone, and,

said gameboard having a portion extending away from the play surface and the annular rim and defining a support surface for supporting said gameboard in a substantially horizontal attitude.

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4,336,939

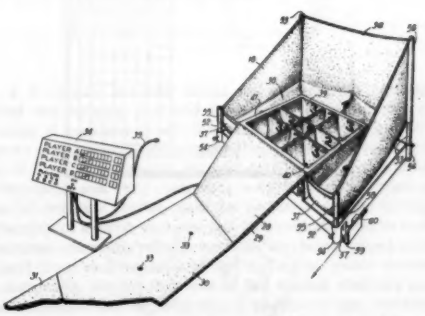
## GOLF CHIP AND PUTT PRACTICE DEVICE AND GAME

Alfred C. Krumlauf, 1450 North Avenue, NE., Atlanta, Ga. 30307

Filed Dec. 5, 1980, Ser. No. 213,307

Int. Cl.³ A63B *69/36*

U.S. Cl. 273—185 R 10 Claims

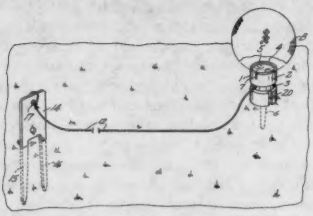


10. A chip and putt golf practice device and game apparatus comprising a pocketed rectangular target with the pockets of the target having open tops disposed in a common horizontal plane, said pockets being disposed orthogonally in rows with the smallest pocket of highest achievement value at the center of the target bounded on opposite sides thereof by larger pockets, said target having still larger pockets at its corners, an underlying support frame supporting the target in a level plane, and a backstop including a lower trough surrounding said target on three sides, said lower trough providing a further scoring area of lesser achievement value.

## 4,336,940
## GOLF TEE HOLDER

Boyd F. Sprague, 16595 SW. Monterey La., Tigard, Oreg. 97223

Filed Jul. 28, 1980, Ser. No. 172,675
Int. Cl.³ A63B 69/36, 57/00
U.S. Cl. 273—208 3 Claims



1. A golf tee holder comprising,

a body of a resilient nature having a lengthwise opening therethrough for inserted reception of a golf tee, said body also defining a tether receiving recess about its outer perimetrical wall, a shoulder at the upper end of said body partially overlying said opening to overlie the subjacent head of a tee inserted therein,

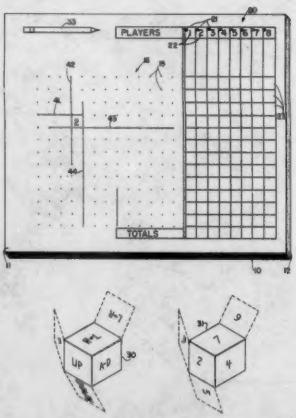
a tether attached to said body with anchor means at the remaining end of the tether and,

said anchor means being of bifurcated shape, said body perimetrical wall additionally defining lengthwise orientated grooves for stowed reception of the anchor means.

## 4,336,941
## METHOD FOR PLAYING A SQUARE FORMING GAME

Karl A. Haines, 101 Egypt Rd., Warren, Pa. 16365

Filed Feb. 27, 1979, Ser. No. 15,658
Int. Cl.³ A63F 3/00
U.S. Cl. 273—240 5 Claims






1. A method of playing a square forming game utilizing a playing surface having a plurality of dots which are arranged in a rectangular array of rows and columns to form a square forming area and which are adapted to be connected together by lines to form a plurality of squares, and employing a pair of six-sided dice, the sides of one die being individually marked with different numerals indicating the overall lengths of the lines to be drawn, respectively, and the sides of the other die being marked with indications of the direction in which connecting lines between the dots may be drawn, the six markings on said other die providing for drawing of such a line in the directions left to right, right to left, up and down, respectively, and in any direction, and in any direction in two or more separate divided lines, respectively, said method comprising:

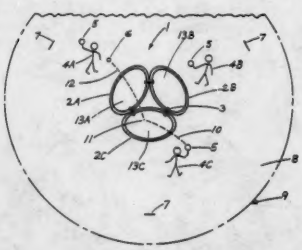
rolling said pair of dice to determine the number and direction of connecting lines to be made between adjacent dots, connecting adjacent dots by connecting lines in accordance with the uppermost markings of the dice as rolled, said connecting step comprising drawing a line from left to right when the said other die indicates left to right, drawing a line from right to left when said other die indicates right to left, drawing a line up when said other die indicates up, drawing a line down when said other die indicates down, drawing a line in any direction when said other die indicates any direction and drawing at least two lines in any direction when said other die indicates in any direction in two or more separate divided lines, the rolling of the dice and the corresponding connecting of adjacent dots being carried out by the players of the game in turn, said connecting lines being initially started on the periphery of said array, and each successive line drawn in that same direction starting at the end of any non-completed line already drawn in that direction, marking any squares which are completed by connecting lines, between the dots, which define the sides of said squares, with an identification mark identifying the player who completed the square, and

determining, when all dots have been connected to form all squares, the player who has completed the largest number of squares.

## 4,336,942
## 3-WAY MINI-TENNIS GAME AND APPARATUS

Norwood R. Warehime, 704 W. 34th St., Baltimore, Md. 21211

Filed Sep. 22, 1980, Ser. No. 189,733
Int. Cl.³ A63B 71/02
U.S. Cl. 273—411 12 Claims



1. A 3-way mini-tennis game and apparatus therefor, wherein the apparatus comprises a small, lightweight resilient play ball, at least three striking bats, a playing surface means, said playing surface means including a game area means, and a 3-way ball passage defining means, said 3-way ball passage defining means being disposed in a general upright position on said playing surface means and in center of said game area means, said 3-way ball passage defining means comprises three identical ball passage defining elements, with each of said defining elements abutting the other two said defining elements, said defining elements being held together in a regular tripod type pattern by fastening means at points of abutment of said defining elements, each of said defining elements in said tripod type pattern being in a separate plane, each said separate plane forming an angle not less than 30° nor more than 90° with plane of said playing surface means, each said angle being measured within the said tripod type pattern, each of said defining elements of said 3-way ball passage defining means being in the form of a circuitous, rigid frame with a generally central open area, each said open area being of a sufficient size

to allow said play ball to readily pass through each said open area of each said frame in game play involving at least three competing players.

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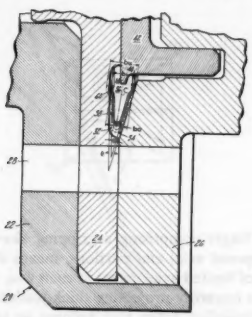
4,336,943

## WEDGE-SHAPED SEAL FOR FLANGED JOINTS

Gary F. Chaplin, Vernon, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Nov. 14, 1980, Ser. No. 207,498
Int. Cl.³ F16J *15/00, 15/54*
U.S. Cl. 277—26 9 Claims



1. A flanged joint for joining the abutting ends of two cylindrical case structures, wherein the improvement comprises:

a pair of outwardly convergent sidewalls, one on each of said cylindrical case ends forming a circumferentially extending groove between the case structures;

a seal ring having a substantially wedge-shaped cross section disposed within said groove; wherein said seal ring is slidable in the outward direction along the convergent sidewalls of the groove in response to increasing temperature causing a compressive sealing force against the wedge-shaped cross section of the seal ring.

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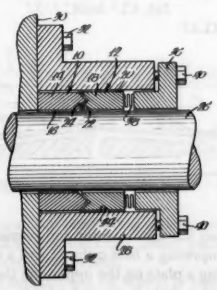
4,336,944

## MECHANICAL-DYNAMIC ROTARY SEAL

W. Roscoe Blair, Charleston, S.C., assignor to Raybestos-Manhattan, Inc., Trumbull, Conn.

Filed Aug. 27, 1979, Ser. No. 69,820
Int. Cl.³ F16J *15/34*
U.S. Cl. 277—81 R 3 Claims



1. In combination, a stuffing box having a passage therethrough, a shaft extending through said stuffing box passage and rotatable therein, and a seal for sealing said shaft in said stuffing box passage, said seal consisting essentially of a pair of annular seal elements positioned coaxially end to end around said shaft and in said stuffing box passage, one of said elements being sealingly mounted about its inner periphery to said shaft and the other of said elements being sealingly mounted about its outer periphery to said stuffing box, adjacent ends of said elements having complementary configured end faces which are moved together into closely mating, sliding and sealed engagement, whereby in use upon relative rotation of said stuffing box and said shaft said one element is stationary relative to said shaft, said other element is stationary relative to said stuffing box, and said end faces are in mating, sealed and sliding engagement and seal said shaft in said stuffing box, and further including adjustable means for urging said end faces together into sliding, sealed and mating engagement with a controllable force to compensate for wear of said end faces and to maintain a secure, leak proof seal therebetween, said adjustable means comprising a gland, means for mounting said gland on said stuffing box about said stuffing box passage for movement toward and away from said stuffing box, said mounting means including external adjustment means operable to move said gland toward or away from said stuffing box, and spring means extending in said stuffing box passage between said gland and the adjacent one of said seal elements for urging said seal element end faces together, whereby operation of said external adjustment means moves said gland toward or away from said stuffing box to increase or decrease the force with which said spring means urges said seal element end faces together.

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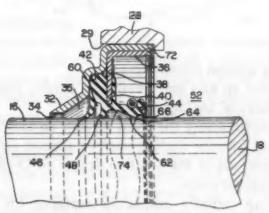
4,336,945

## SINUOUS SEAL WITH AUXILIARY EXCLUDER LIPS

Keith W. Christiansen, Fox River Grove, and Anthony W. Vering, Arlington Heights, both of Ill., assignors to CR Industries, Elgin, Ill.

Filed Mar. 18, 1977, Ser. No. 779,259
Int. Cl.³ F16J *15/32*
U.S. Cl. 277—153 2 Claims



1. A radially inwardly acting seal assembly for creating a fluid seal between first and second, relatively movable elements, at least one of which is arranged for rotation about a given axis, said unit having a mounting portion thereof adapted to be fixedly associated in use with said first element, a unitary elastomeric seal body comprising a dirt exclusion portion and an oil retention portion, said dirt exclusion portion having a plurality of annular excluder lips, said excluder lips, as manufactured, extending radially inwardly and being spaced axially apart from each other, said lips having an inside diameter substantially smaller than that of said second relatively movable element, said excluder lips, in position of use, contacting and lying along said second element, and being flexed thereby so that the inner portions thereof extend radially inwardly as well as axially away from the region to be sealed, said oil retention portion comprising a generally annular, flexible primary hydrodynamic sealing lip portion disposed, in use, in a generally facing relation to said second element and defined at least partially by converging first and second, at least partially axially undulating frustoconical lip surfaces meeting each other along an axially undulating seal band area formed at the convergence of said undulating lip surfaces, said seal band undulating so as to have portions thereof lying on either side of an imaginary plane lying parallel to the plane of said seal

mounting portion and substantially perpendicular to said given axis of said movable member, said first lip surface at least partially facing the surface of said second element lying on the exterior of a region in which a fluid is to be sealed, and said second lip surface at least partially facing the surfaces of said second element lying on the interior of said region in which said fluid is to be sealed, the included angle between said first lip surface and the surface of said second element being less than the included angle between said second lip surface and the surface of said second element, said angles being measured as said seal is in a normally installed position of use over said second member, the seal bands of all of said lips being of substantially constant radius throughout their entire extents, said seal assembly further including as a part of said dirt exclusion portion, a protective flange affixed to said mounting portion, said protective flange extending radially inwardly and being inclined away from said region to be sealed, said protective flange having an annular inner surface closely spaced apart from said second element.

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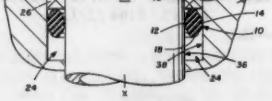
**4,336,946**

## NON-ROTATABLE ELASTOMERIC O-RING SEAL

**John H. Wheeler, Dallas, Tex., assignor to The Texacone Company, Dallas, Tex.**

**Filed Sep. 8, 1980, Ser. No. 185,205**
**Int. Cl.³ F16J *15/24, 15/32***
**U.S. Cl. 277—211** **1 Claim**



1. A sealing system comprising:

a shaft having an axis and having an axially extending exterior cylindrical sealing surface;

a housing surrounding the shaft having an axially extending cylindrical interior sealing surface spaced apart from the exterior surface of the shaft to define an O-ring receiving cavity therebetween;

means having radially extending surfaces for closing the opposite ends of the O-ring receiving cavity so that the O-ring receiving cavity is rectangular in cross section;

said shaft and said housing adapted for relative movement so that an O-ring in the O-ring receiving cavity tends to roll relative to the sealing surfaces;

an O-ring positioned in the rectangular O-ring receiving cavity and comprising a main body portion circular in cross section normally having a first relatively large predetermined radius and including an inner sealing surface engaging the outer sealing surface of the shaft around its entire periphery and an outer sealing surface engaging the inner sealing surface of the housing around its entire periphery;

said O-ring further including opposed projections normally extending axially from the main body portion thereof, said projections being extended between the sealing surface of the main body portion and being semicircular in cross section;

said projections each normally having second predetermined radius substantially smaller than the first predetermined radius;

said opposed projections being integrally formed with the main body portion of the O-ring and extending around the entire circumference thereof; and

said O-ring comprising the only structure within the rectangular O-ring receiving cavity so that the projections prevent the O-ring from rolling relative to the sealing surfaces of the shaft and the housing.

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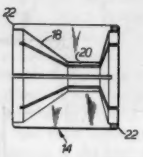
**4,336,947**

## WORKPIECE FEED DEVICES

**Reginald A. Franklin, Witney, England, assignor to Crawford Collets Limited, Witney, England**

**Filed Dec. 28, 1979, Ser. No. 108,037**
**Claims priority, application United Kingdom, Jan. 30, 1979, 7903233**
**Int. Cl.³ B23B *5/22***
**U.S. Cl. 279—46 A** **6 Claims**



1. A feed finger comprising a gripping sleeve, said sleeve including opposed axial end portions, means defining a thin-walled zone of limited axial extent at each axial end portion of the sleeve, an inwardly-projecting thick-walled zone intermediate said thin-walled zones and defining an internal bore in which the workpiece can be frictionally gripped, and means defining a series of angularly-spaced slots which split the sleeve into segments, each said slot extending axially of the sleeve over substantially the entire length of the sleeve, each slot having an open end opening onto one end of the sleeve and a closed end lying within the thin-walled zone at the other end of the sleeve, alternate slots opening into opposite ends of the sleeve, and means co-operating with the gripping sleeve for applying to each end of the sleeve a radially inwardly-directed compressive force which acts to displace the segments radially inwardly against a resilient bias to define a selected cross-sectional bore size within a predetermined range, each said segment when moving inwardly remaining parallel to itself.

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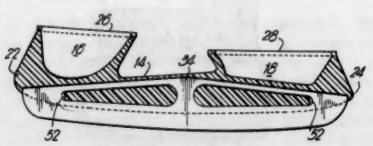
**4,336,948**

## SKATE BLADE

**George Couture, 1301, rue De-Laune, Quebec City, Quebec, Canada**

**Filed Jan. 25, 1980, Ser. No. 115,231**
**Claims priority, application Canada, Jul. 13, 1979, 331741**
**Int. Cl.³ A63C *1/32***
**U.S. Cl. 280—11.12** **4 Claims**



1. A combined ice skate runner and plastic holder therefor, said holder comprising a heel column and a sole column, each column including a plate on the upper end thereof for connecting the holder to a skate boot, and a bridge member interconnecting said columns; said runner comprising a planar, elongated metal body having a lower portion including a hardened, ice-engaging edge and an upper portion embedded in the plastic holder, said runner having a wide central web intermediate the upper and lower edges and at least one elongated opening on either side of said web; each said opening being completely surrounded by portions of said metal body, said opening taper-

ing downwardly in width from the central web towards the ends of the runner such that, during construction, the material of the plastic holder flows through said openings and shrinks toward the central web of the runner.

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**4,336,949**
**BASKET FOR A SKIPOLE**

**Yrjö Aho, Kuninkaanniemi, 02160 Espoo 16, Finland**

**Filed Nov. 12, 1976, Ser. No. 741,358**
**Claims priority, application Finland, Nov. 13, 1975, 753193**
**Int. Cl.³ A63C *11/24***
**U.S. Cl. 280—824** **4 Claims**

1. A basket for a skipole with hard straps comprising a rigid periphery frame and a sole connecting piece between said skipole and the periphery frame, said sole connecting piece being an axle having an axis perpendicular to said skipole, and being asymmetrically fastened at both of its ends to said frame forwardly of the center of said frame without free play and tautly bridging said frame, said axle being of rubber or soft plastic, and said axle thus acting between the frame and the skipole as an elastic torsion piece whereby said skipole can be rotated back and forth about said axis of said axle without moving said frame.

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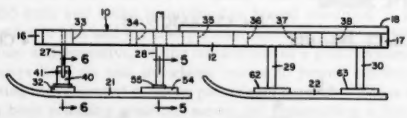
**4,336,950**
**SLED**

**John Zepkowski, R.D. 2, Canton, Pa. 17724**

**Filed Sep. 8, 1980, Ser. No. 184,755**
**Int. Cl.³ B62B *13/12***
**U.S. Cl. 280—16** **5 Claims**



1. A sled comprising
a frame,
means on said frame for supporting at least one rider,
a pair of front skis, one disposed under each side of said frame at the front end thereof,
a front strut, the top portion of which is rigidly affixed to said frame,
means for connecting the bottom portion of said front strut to said ski in such a manner that the front portion thereof is capable of pivoting about the axis of said front strut and is capable of tilting about the longitudinally axis thereof,
a rear strut,
first strut support means mounted on said frame for pivotal rotation about a first axis that is parallel to the longitudinal axis of said sled, said first strut support means supporting said rear strut,
means for connecting the bottom portion of said rear strut to said ski in such a manner that said ski is capable of pivoting about the axis of said rear strut, and
steering means for causing said strut support means to pivot about said first axis whereby the rear portion of said front ski swings to the side and the bottom surface of said ski tilts about its longitudinal axis.

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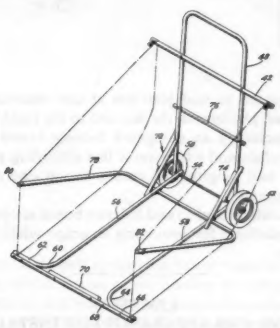
**4,336,951**
**CART**

**William R. Crothers, 424 W. Springfield Rd., Springfield, Pa. 19064**

**Division of Ser. No. 939,398, Sep. 5, 1978, Pat. No. 4,222,585.**
**This application Jun. 2, 1980, Ser. No. 155,393**
**Int. Cl.³ B62B *11/00***
**U.S. Cl. 280—47.26** **1 Claim**



1. A cart comprising:
a scoop-shaped body of flexible sheet material, said body having an open front, a bottom wall, a rear wall, and side walls extending upwardly from the bottom wall;
a pair of wheels rotatable on an axle located adjacent the intersection of said rear wall and said bottom wall;
frame means comprising a first substantially rigid frame member connected to said axle and extending substantially from the front edge of said bottom wall to said axle, and a second substantially rigid frame member connected to said axle and extending from said axle at least to the upper edge of said rear wall;
brace means connecting said first and second frame members and adapted to hold said first and second frame members in rigid relationship to each other, said wheels being located behind said body and laterally inwardly with respect to said side walls, and said brace means being located between said flexible sheet material and said wheels, and preventing contact between said material and said wheels.

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**4,336,952**
**VEHICLE WITH A BALANCING PLANE**

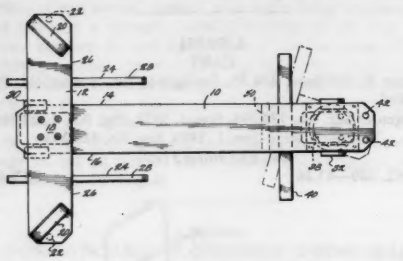
**Arnold Rochman, 940 Bender Bldg., 1120 Conn. Ave. NW., Washington, D.C. 20036**

**Filed Jan. 22, 1980, Ser. No. 114,319**
**Int. Cl.³ B62B *11/00***
**U.S. Cl. 280—87.01** **3 Claims**

1. A coaster device comprising:
an elongated planar platform for supporting a rider, said platform having a forward and rearward end, an underside and a longitudinal center line extending along the length of said platform;
wheeled truck means connected to said underside of said platform along said center line for turning to the left and right of said center line in response to the tilting of said

platform respectively to the left and right about said center line;

said wheeled truck means including at least one steerable, rotatable wheel, pivotally mounted to said platform for pivoting about an axis perpendicular to the plane of said platform, and means engagable with said platform, and said truck means, for releasably locking said wheel against pivoting;



means mounted to said platform at said rearward end for tilting said platform to the left and to the right, said tilting means including an elongated balance board having an upper surface and a transverse line extending perpendicularly to said longitudinal center line at one end of said platform; and

a pair of handles fixed to said balance board at opposite sides of said platform for providing leverage when tilting said platform.

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**4,336,953**

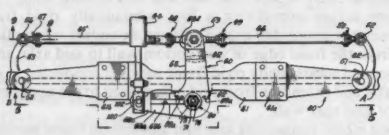
## METHOD AND APPARATUS FOR INSTALLING STEERING AXLE PIVOT PINS

**Leonard J. Low, P.O. Box 1927, Sparks, Nev. 89431**

**Continuation-in-part of Ser. No. 938,086, Aug. 30, 1978, Pat. No. 4,220,348. This application Jun. 30, 1980, Ser. No. 164,249**

**Int. Cl.³ B60D *5/08***

**U.S. Cl. 280—95 R** **4 Claims**



1. The method of installing a pivot pin and bearing assembly to a steering axle of a lift truck which includes attaching a bearing housing to the steering axle of the lift truck, inserting a bearing into said bearing housing, providing thrust washers at upper and lower ends of said bearing housing, straddling said bearing housing and bearing and thrust washers with upper and lower bifurcations of a steering control arm so that openings in said bifurcations are aligned axially with said bearing, which method includes: (1) providing a longitudinal bore into the said pivot pin axially aligned with the axis of the pivot pin but offset from the axis so as to extend into the said pivot pin at a point between the center of the said pivot pin and an outer surface of said pivot pin; (2) providing threads for a distance on the exterior of each end of said pivot pin; (3) providing a port communicating from the exterior of said pivot pin to the internal bore of said pivot pin in the vicinity of the said bearing; (4) providing cotter pin bores adjacent each of said threaded ends passing diametrically through said pivot pin in such a manner that neither of said cotter pin bores will intersect said longitudinal bore in said pivot pin; (5) securing said pivot pin by threading a castle nut to each end of said pivot pin; and (6) inserting cotter pins through the cotter pin bores in such a manner as to fasten the castle nuts in position.

**4,336,954**

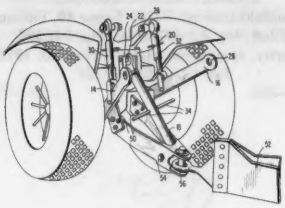
## TRACTOR TRAILER HITCH

**Victor R. Orvis, 1250 N. Ralston, Anaheim, Calif. 92801**

**Filed Jan. 21, 1980, Ser. No. 113,460**

**Int. Cl.³ B60D *1/00***

**U.S. Cl. 280—415 R** **7 Claims**



7. A trailer hitch for a tractor equipped with a three-point implement hitch for attaching an implement to said tractor which implement hitch attaches to said implement at said three-point hitch which consists of two spaced-apart lift arms and a center support member pivotally attached to said tractor and extending outwardly from said tractor, comprising:

(a) means for rigidly attaching said trailer hitch to said tractor, said trailer hitch extending rearwardly between said lift arms of said three-point hitch,

(b) means for detachably connecting a trailer to the distal end of said trailer hitch, said trailer connecting means of said hitch terminating forwardly of the rear ends of said lift arms,

(c) means for connecting the outwardly extending end of said center support member to the distal end of said trailer hitch to brace said trailer hitch to said tractor for pulling said trailer, and

(d) the distal end of said trailer hitch being sufficiently rearward of said tractor to permit turning of the tractor when said trailer is connected thereto.

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**4,336,955**

## SAFETY SKI BINDING

**Hans Schmidt, Neu-Germering, Fed. Rep. of Germany, assignor to Hannes Marker, Garmisch-Partenkirchen, Fed. Rep. of Germany**

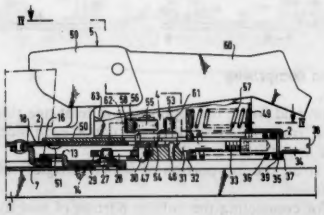
**PCT No. PCT/EP79/00008, § 371 Date Oct. 6, 1979, § 102(e) Date Oct. 5, 1979, PCT Pub. No. WO79/00591, PCT Pub. Date Aug. 23, 1979**

**PCT Filed Feb. 6, 1979, Ser. No. 170,675**

**Claims priority, application Fed. Rep. of Germany, Feb. 6, 1978, 2804986**

**Int. Cl.³ A63C *9/08***

**U.S. Cl. 280—618** **4 Claims**



1. A safety ski binding comprising a sole plate which is rotatably mounted on the ski surface in the heel region of the ski boot on a pivot extending perpendicular to the ski surface, is secured against lifting off, has a toe holder at its front end

and has at its rear end a spring-loaded automatic heel mechanism for the ski boot that has a sole retainer and a first spring whose force must be overcome to allow upward movement of the sole retainer to release the ski boot on the occurrence of a frontal fall load exceeding the spring resistance of the first spring, characterized in that slideways are secured to the upper surface of the ski, in that the sole plate has slideways extending transverse to the longitudinal direction of the ski in the toe and heel regions of the ski boot that are engageable with the slideways secured to the ski for securing the sole plate against lifting off, and in that the automatic heel mechanism has a separate spring exerting a force opposing release of the ski boot on the occurrence of a rotary fall so that release takes place on the occurrence of an excessive rotary fall only after overcoming the resistance of the separate spring, said automatic heel mechanism further comprising a housing mounted on the sole plate for displacement lengthwise of the ski and carrying said sole retainer, a third spring supported on the sole plate for exerting a force moving the housing in a release direction of the automatic heel mechanism, and lock means for preventing movement of said housing by said third spring, said separate spring exerting a force on said lock means such that said lock means is moved into a position releasing said housing after said sole plate has pivoted a predetermined amount about its pivot.

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## 4,336,956
## SAFETY TOE UNIT FOR A SKI BINDING

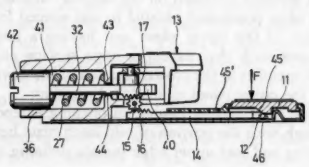
**Manfred Richert, Farchant, and Ralf Storandt, Leonberg, both of Fed. Rep. of Germany, assignors to Vereinigte Baubeschlagfabriken Gretsch & Co. GmbH, Leonberg, Fed. Rep. of Germany**

**Filed Jan. 17, 1980, Ser. No. 112,813**

**Claims priority, application Fed. Rep. of Germany, Feb. 15, 1979, 2905837**

**Int. Cl.³ A63C *9/08***

**U.S. Cl. 280—625** **29 Claims**




1. A safety toe unit for a ski binding having a safety release mechanism comprising toe clamp means for releasably securing the toe of a ski boot to a ski, spring means having first and second ends and being maintained in biased condition to be operative to bias said toe clamp means into a ski boot securing position and operative, on the occurrence of a predetermined sideways load on said toe clamp means to permit sideways pivoting movement of at least a part of said toe clamp means to a ski boot releasing position, means for transmitting a force from said toe clamp means to said first end during said sideways pivoting movement to produce corresponding movement of said first end and abutment means for reacting said force at said second end of said spring means, a force signalling device adapted to be arranged at a position corresponding to the position adopted in operation by the ball region of the sole of the ski boot, said force signalling device being responsive to pressure exerted from above to generate, via a force transmission device, an auxiliary force active on said first end in the direction of the first said force whereby to reduce the bias of said spring means on said toe clamp means to assist the release thereof, and wherein the mechanical advantage produced by said force signalling device and said transmitting device is such that the magnitude of said auxiliary force is always smaller than the spring bias which determines the release setting of the binding for any load exertable by a skier through the ball region of the ski boot on said force signalling device.

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## 4,336,957
## PASSIVE SAFETY BELT SYSTEM FOR MOTOR VEHICLES

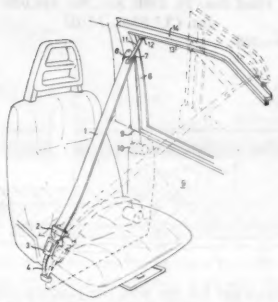
**Bengt I. Schultz, Göteborg, and Göran Svensson, Alingsas, both of Sweden, assignors to AB Volvo, Göteborg, Sweden**

**Filed Oct. 16, 1980, Ser. No. 197,537**

**Claims priority, application Sweden, Oct. 23, 1979, 7908767**

**Int. Cl.³ B60R *21/10***

**U.S. Cl. 280—803** **4 Claims**



1. Passive safety belt system for motor vehicles, comprising a belt band, which has an active portion extending diagonally across a vehicle seat from a lower point of attachment at or in the vicinity of the floor of the vehicle via a redirecting fitting which is attached to the rear portion of a window frame of a door adjacent said seat, to a reel mechanism arranged in the door, characterized in that the belt band is joined, in the vicinity of the redirecting fitting, to one end of a strap, the other end of which is provided with a cursor, which is displaceable in a track, which extends along the upper portion of the door window frame, such that, when the opening angle of the door increases, the belt band loads, via the strap, the cursor with a forwardly directed force component, which displaces the cursor towards the front end of the track.

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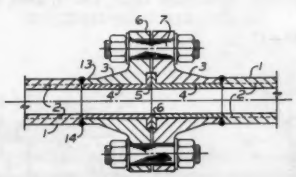
## 4,336,958
## PIPE FLANGE

**John Goetzinger, 2956 W. 17th St., Erie, Pa. 16506**

**Continuation-in-part of Ser. No. 859,297, Dec. 12, 1977, abandoned. This application Aug. 9, 1979, Ser. No. 65,342**

**Int. Cl.³ F16L *9/14, 23/00***

**U.S. Cl. 285—55** **4 Claims**




1. A pipe flange coupling having a carbon steel body and flange, a bore extending through said body and flange, a bolt circle in said flange, a tube of corrosion resistant material telescoped in said bore and united thereto by an annular electron beam weld of fused metal extending axially along and embracing the junction between said tube and said bore throughout the length and circumference of said bore, the

weld being wedge shaped in radial cross section with the greatest radial thickness at one end of the tube, said fused metal consisting of said carbon steel and said corrosion resistant material, and a sealing surface on said flange radially inward of said bolt circle and radially outward of said bore, said sealing surface being provided by a cladding of corrosion resistant material fusion welded to said flange and to fused metal and to said tube.

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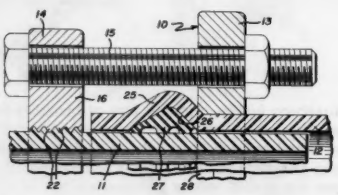
4,336,959

## JOINT RESTRAINER SYSTEM

Charles W. Roche, Northboro, Mass., assignor to Uni-Flange Corporation, Northboro, Mass.

Filed Jun. 19, 1980, Ser. No. 161,038
Int. Cl.³ F16L 17/02
U.S. Cl. 285—368 4 Claims



1. Joint restrainer for use with the junction formed by the ends of two conduits in which the end of a first of two conduits is telescopingly located within the end of a second of said two conduits, wherein one of the conduits has an annular outwardly-extending corrugation adjacent to, but spaced from, its end, said joint restrainer comprising:

(a) a retainer ring extending around and locked to one of said conduits by pressing against the corrugation,

(b) a clamping ring extending around the other of said conduits adjacent its end, said clamping ring consisting of two semi-circular elements having corresponding end flanges, each element having an inner cylindrical surface provided with serrations,

(c) first bolt means extending through the end flanges of the clamping ring for drawing the two semi-circular elements together and causing said serrations to bite into said other conduit for locking the clamping ring to said other conduit, and

(d) second bolt means extending between the retainer ring and the clamping ring to prevent longitudinal movement of said one conduit away from said other conduit.

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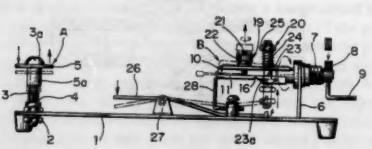
4,336,960

## SNELL COILING DEVICE

Mikio Seki, No. 683-3, Fussa, Fussa-shi, Tokyo, Japan

Filed May 23, 1980, Ser. No. 152,579
Claims priority, application Japan, Feb. 1, 1980, 55-10298
Int. Cl.³ A01K 91/06; D04G 5/00
U.S. Cl. 289—17 7 Claims



1. A device for securing a snell about a fish hook, comprising a base; snell holding means for holding one end portion of the snell and mounted on one end side of said base; fish hook holding means mounted on another end side of said base and having a lower plate and an upper plate to receive a fish hook therebetween and connecting means for adjustably connecting said lower plate to said upper plate, said fish hook holding means including means for engaging and positioning another end portion of the snell and operative for securing said another end portion, said lower plate being formed with a hole, said fish hook holding means further including a detachable pin which is inserted through said hole and is operative for holding a loop of the snell and for releasing said loop when said pin is removed from said hole; and securing means for securing said another end portion of the snell about the fish hook held between said upper and lower plates.

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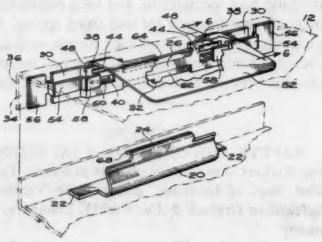
4,336,961

## LATCH FOR A CASSETTE

Clark E. Harris, Fairport, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed May 23, 1980, Ser. No. 152,871
Int. Cl.³ E05C 3/30
U.S. Cl. 292—254 4 Claims



1. A latch for a cassette having a bottom panel, and a cover panel having a depending lip portion, the bottom and cover panels being movable between open and closed positions, comprising:

a catch member mounted on the cassette bottom panel;

a latch plate positioned parallel to and spaced from the lip portion of the cover panel and having a latch portion disposed such that its upper edge surface engages said catch member in the closed position of the cover panel to lock the cover panel in its closed position;

said latch plate further having an opening extending therethrough with the portion of said latch plate between said opening and said upper edge surface defining a hinge bar adjacent said opening; and

a latch operating lever pivotally mounted and solely supported between said hinge bar and said lip portion; said lever having an actuating part and being pivotal about said hinge bar to cause said actuating part to extend through said opening to engage said catch member and disengage it from said latch plate to unlock the cover panel.

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4,336,962

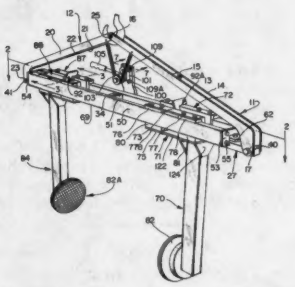
## ADJUSTABLE LIFTING TONG

Owen R. Read, R.F.D. #1, Box 110, Chepachet, R.I. 02814

Filed Oct. 24, 1980, Ser. No. 200,531
Int. Cl.³ B66C 1/00
U.S. Cl. 294—106 4 Claims

1. An adjustable lifting tong comprising a thrust bar consisting of a right side section and a left side section, a bracket, a slide bar fastened to said brace and extending on opposite ends, respectively, into said right side section and left side section to support sliding movement of said right end section and left end section toward and away from each other, a right side link member and a left side link member, a stud, means pivotally connecting said right side link member and said left said link member to said stud, a right side axial, means pivotally connecting said right side section and said right side link member to said right side axel, a second axial means pivotally connecting said left side section and said left side link member to said

second axial, a front horizontal rail, a rear horizontal rail, a right end plate securing said front rail and said rear rail in spaced relation, a left end plate securing said front rail and said rear rail in spaced relation on the end opposite said right end plate, a first bearing means fastened to said right end plate and interposed between said right end plate and said right side section, a second bearing means fastened to said left end plate and interposed between said left end plate and said left side section, means fastening said brace to said front horizontal rail and said rear horizontal rail, said right side section having right side ratchet teeth, said left side section having left side ratchet teeth, a right side gripping leg having a left side right end jaw slidably mounted upon said front horizontal rail, and a right side right end jaw slidably mounted upon said rear horizontal rail, a left side gripping leg having a left side left end jaw slidably mounted upon said front horizontal rail, and a right side left end jaw slidably mounted upon said rear horizontal



rail, a right side pawl pivotally mounted between said left side right end jaw and said right side right end jaw, resilient means resiliently holding said pawl in engagement with said right side ratchet teeth, a left side pawl pivotally mounted between said left side left end jaw and said right side left end jaw, a second resilient means resiliently holding said left side pawl in engagement with said left side pawl, a bracket fastened to said rear horizontal rail, a lever arm pivotally mounted to said bracket, a chain pulley pivotally connected to said lever arm, a handle fastened to said lever arm and a chain fastened on one end to said right side link member and on the other end to said left side link member with the medial arm of said chain engaging said chain pulley, whereby pivotal movement of said handle slidably moves said right hand section and said left hand section towards and away from each other and the, respectively, attached right side gripping leg and left side gripping leg toward and away from each other, simultaneously.

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**4,336,963**

## TRUCK BED LINER

**Edwin L. Nix, 733 Tahlena Ave., and Bobby E. Davenport, 317 Beckley Dr., both of Madison, Tenn. 37115**

**Filed Feb. 21, 1979, Ser. No. 13,170**

**The portion of the term of this patent subsequent to Sep. 5, 1995, has been disclaimed.**

**Int. Cl.³ B62D *33/02***

**U.S. Cl. 296—39 R** **5 Claims**

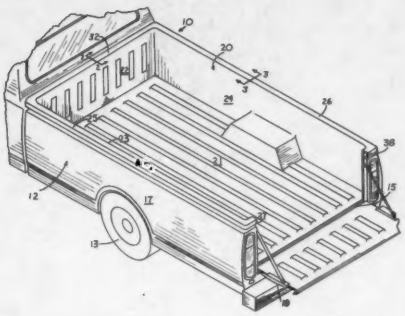
1. A protective liner for a rectangular truck bed having a bottom wall, a front wall, opposed side walls, and an open rear end, closable by a tailgate, each front wall and side wall having an interior surface, an exterior surface and a top ledge projecting outward from each interior surface and terminating in a free rim, comprising:

(a) an integral bottom liner wall, front liner wall and opposed side liner walls of continuous, semi-rigid material adapted to fit within the interior surfaces of the corresponding bottom wall, front wall and opposing side walls of the truck bed, in operative position,

(b) said side liner walls terminating in rear end portions spaced apart to form a rear opening to substantially conform with the open rear end of the truck bed, in operative position,

(c) each of said side liner walls having a top portion, and a hook-shaped flange integrally formed with, and projecting laterally outward from, said top portion,

(d) each of said hook-shaped flanges having a substantially transverse flange portion projecting outward across the



top ledge of the corresponding truck bed side wall, and an outer lip projecting downward from said flange portion outside of and substantially against the free rim of said corresponding truck bed wall, in operative position, and

(e) each of said hook-shaped flanges being substantially semi-rigid for fitting over said corresponding top ledge and free rim, to hold said side liner walls upon their corresponding truck bed side walls without any independent fastener member in operative position.

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**4,336,964**

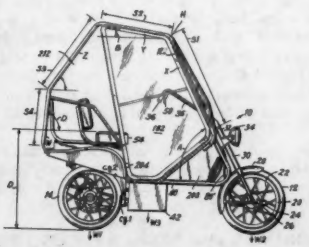
## LIGHTWEIGHT CANOPY FOR THREE-WHEELED VEHICLE WITH LOW CENTER OF GRAVITY

**Stuart Pivar, New York, N.Y., assignor to American Microcar Incorporated, Farmingdale, N.Y.**

**Continuation of Ser. No. 111,199, Jan. 11, 1980, which is a continuation-in-part of Ser. No. 963,282, Nov. 24, 1978, Pat. No. 4,237,995. This application Mar. 17, 1980, Ser. No. 131,165**

**Int. Cl.³ B60J *7/10*; B62J *17/00***

**U.S. Cl. 296—78 R** **10 Claims**

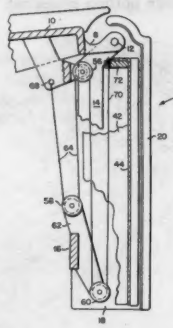


1. A lightweight canopy for the sheltering of passengers in a vehicle, said canopy comprising spaced and parallel tubular frame parts of inverted generally U-shaped configuration, said frame parts including front and rear extremities, a transverse connecting member connecting the rear extremities of said parts, the U-shaped parts including bight portions resiliently deflectable towards each other, and at least one flexible cover portion mounted between said bight portions when the latter are deflected towards each other, and held under tension with the bight portions released and thereby tending to assume normal positions of rest.

## 4,336,965
## EXPANDABLE LEGREST FOR DENTAL CHAIRS

Herbert Lipp, Pfinztal, Fed. Rep. of Germany, assignor to Sybron Corporation, Rochester, N.Y.

Filed May 15, 1980, Ser. No. 150,087
Int. Cl.[3] A61G 15/00; A47C 7/50
U.S. Cl. 297—435 4 Claims



1. In a dental chair including a seat frame, a legrest pivotally connected to the forward end of the seat frame, a drive for moving the legrest about the pivot between generally vertical and horizontal limits of travel, an extension telescopically nested within the legrest and a cable and pulley system for moving the extension from its nested position as the legrest moves to its horizontal limit of travel, the improvement comprising:

(a) said pulley and cable system is a double block and tackle including

(i) a first pulley (56) journaled to the seat frame beneath and rearward of the pivot connection of the legrest to the seat frame,

(ii) second and third pulleys (58, 60) journaled to the legrest, and

(iii) a cable (64) passing over said pulleys, one end of said cable being fixed to the seat frame adjacent said first pulley and the other end of said cable being fixed to the rear of the extension, the path of said cable being such that said first pulley occupies a position in the cable and pulley system which is intermediate said second and third pulleys;

(b) said drive includes a motor (22) and a driven member (28, 30), said motor being pivotally connected at one end (24) to the seat frame beneath and rearward of the pivot connection of the legrest to the seat frame and said driven member being operatively connected to said motor and the legrest so that said motor and driven member both move between vertical and horizontal limits of travel when said motor is operated to raise and lower the legrest; and

(c) bias means acting between the legrest and extension for urging said extension to its telescopically nested position.

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## 4,336,966
## CRATERING IN THE DEEP CRATERING REGION TO FORM AN IN SITU OIL SHALE RETORT

Thomas E. Ricketts, Grand Junction, Colo., assignor to Occidental Oil Shale, Inc., Grand Junction, Colo.

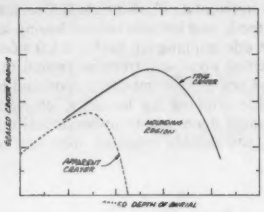
Continuation of Ser. No. 91,346, Nov. 5, 1979, abandoned. This application Oct. 14, 1980, Ser. No. 196,743
Int. Cl.[3] E21B 43/247, 43/263; E21C 41/10
U.S. Cl. 299—2 75 Claims

55. A method for forming an in situ oil shale retort in a subterranean formation containing oil shale, the in situ oil shale retort containing a fragmented permeable mass of formation particles containing oil shale comprising the steps of:

excavating at least one void within the boundaries of the in situ oil shale retort being formed and leaving a zone of unfragmented formation above such a void having a horizontally extending free face over the void;

drilling a plurality of vertical blasting holes in the zone of unfragmented formation;

loading explosive charges in such blasting holes for forming an array of explosive charges having a ratio of spacing



distance to burden distance less than about one and sufficient explosive in each blasting hole to fragment formation substantially to a plane at the ends of such charges remote from the void, and an array scaled depth of burial in the range of from about 6 to 12 mm/cal$^{1/3}$; and

detonating such explosive charges for explosively expanding such zone towards the void for forming a fragmented permeable mass of formation particles in the retort.

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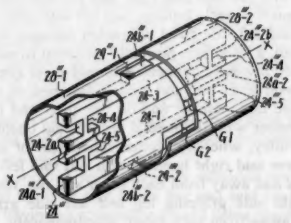
## 4,336,967
## BEARING APPARATUS

Takeshi Hojo, and Michio Fukano, both of Kuroiso, Japan, assignors to K.K. Tokyo Keiki, Tokyo, Japan

Filed Jan. 14, 1980, Ser. No. 111,670
Int. Cl.[3] F16C 11/12
U.S. Cl. 308—2 A 1 Claim



1. A bearing apparatus comprising, a fixed portion, a rotary member, a first cylindrical member which is to be secured to said fixed portion and has a tubular axis coincidence with a rotation axis of said rotary member, a second cylindrical member which is to be secured to said rotary member and has a tubular axis coicidence with the rotation axis of the rotary member, first and second opposed bar members respectively attached to said first and second cylindrical members on the insides thereof and aligned with each other, two flexible members attached to said first and second opposed bar members at opposite ends thereof so as to form a single substantially rectangular frame body, each of said two flexible members having a pair of arms and elongated reduced cross-section portions aligned on the common center axis of said first and second cylindrical members so that flexure can occur on said central axis of said first and second cylindrical members on said common axis, said pair of arms of said first one of said two flexible members extending from the reduced cross-section portion on either side thereof to said first and second opposed bar member, said pair of arms of said second one of said two flexible members extending from the reduced cross-section portion on

either side thereof to said first and second opposed bar members and said pair of arms of said two flexible members having a greater thickness in a direction lying in a plane lying in a diameter of said first and second cylindrical members than they have in a direction normal to said plane.

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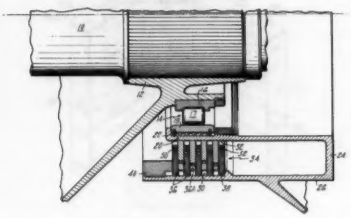
4,336,968

## VISCOUS/FRICTION DAMPER

David H. Hibner, Colchester, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Dec. 11, 1980, Ser. No. 215,300
Int. Cl.³ F16C *27/04*
U.S. Cl. 308—26 5 Claims



1. For a rotor rotatably supported by a bearing, first damping means having a fluid cavity and fluid therein surrounding said bearing and damping a first magnitude of vibrations, a second damping means having a plurality of axially juxtaposed circular plates surrounding said fluid cavity and being in friction relationship with each other, connection means serially interconnecting said first damping means and said second damping means including resilient means, said resilient means responding solely to a second magnitude of vibrations exceeding the first magnitude of vibrations for displacing alternate friction plates in a direction that is opposite and normal to each other.

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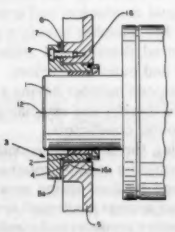
4,336,969

## JOURNAL BEARING

Peter Kahlert, Radebeul; Norbert Dittmann; Heiner Fink, both of Dresden; Frank Junker, Radebeul; Günter Lehmann, Coswig; Horst Schulz, Dresden; Hans Johne, Radebeul; Arndt Jentzsch, Coswig, and Werner Kühnert, Radebeul, all of German Democratic Rep., assignors to VEB Kombinat Polygraph "Werner Lamberz", Leipzig, Leipzig, German Democratic Rep.

Filed Jun. 2, 1980, Ser. No. 155,482
Claims priority, application German Democratic Rep., May 14, 1979, 212839
Int. Cl.³ F16C *35/02*
U.S. Cl. 308—61 8 Claims



1. A journal bearing of a printing machine for supporting a shaft having a central axis in a bore of a frame, comprising a flanged bearing sleeve having a portion coaxially arranged to the shaft; and adjusting means for moving the flanged bearing sleeve relative to the frame so as to compensate for misalignments of the bore, said bore having a predetermined depth, said flanged bearing sleeve being formed with a projecting centering member integral with said portion of the sleeve and abutting said frame at the inner side thereof, said centering member having a width which is smaller than the predetermined depth of said bore so that two annular clearances are formed which are defined by the frame, the flanged bearing sleeve and the centering member.

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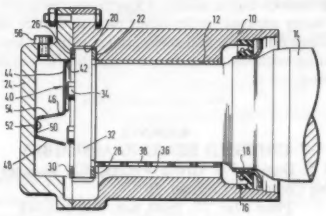
4,336,970

## BEARINGS

Norman F. Burkinshaw, Greenford, England, assignor to Vandervell Products Limited, Maidenhead, England

Filed Jun. 23, 1980, Ser. No. 161,819
Int. Cl.³ F16C *33/10*; B61F *17/30*
U.S. Cl. 308—79 R 8 Claims



1. A bearing assembly for an axle comprising a housing having at least one cylindrical bearing liner mounted therein and having a cylindrical bearing surface to receive the axle from one end of the housing, sealing means at said one end of the housing to form a lubricant seal with the axle, oppositely facing annular thrust faces on the housing for engaging oppositely facing annular thrust faces on the axle, the housing including a hollow end cap at said other end providing a lubricant reservoir, a delivery passage extending from the reservoir to a bottom region of the bearing surface of the bearing liner to permit flow of lubricant from the reservoir to the liner, baffle means interposed between the inner surface of the end cap and the adjacent end of the axle including at least one deflector plate extending from the baffle to the interior surface of the end cap to define a space between the remainder of the baffle and the end cap, and breather means in said upper region of the end cap in communication with the atmosphere and with said space.

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4,336,971

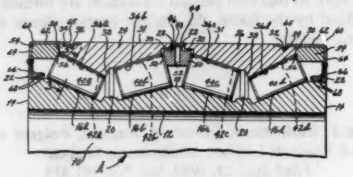
## UNITIZED MULTIROW TAPERED ROLLER BEARING

Gerhard Reiter, Massillon, Ohio, assignor to The Timken Company, Canton, Ohio

Continuation of Ser. No. 971,919, Dec. 21, 1978, Pat. No. 4,235,485. This application Jul. 28, 1980, Ser. No. 172,816
The portion of the term of this patent subsequent to Nov. 25, 1997, has been disclaimed.
Int. Cl.³ F16C *33/78*
U.S. Cl. 308—187.2 7 Claims

1. A multirow bearing comprising: an inner race having a pair of tapered end raceways and at least one intermediate raceway located between the end raceways, the end raceways having their large ends presented away from each other and away from the intermediate raceway; an outer race having at least one intermediate raceway surrounding the intermediate raceway of the inner race and a pair of end raceways surrounding the end raceways of the inner race so that each raceway on the outer race surrounds and corresponds to a different raceway on the inner race; rollers arranged in rows between corresponding raceways of the inner and outer races, there being a

different row of rollers between each set of corresponding intermediate and end raceways; end rib rings located against the ends of the outer race and projecting inwardly past the large diameter ends of the end raceways such that the large ends of the rollers in the end rows abut against the end rib rings and are prevented from being expelled from the bearing by the



rib rings; seal cases fitted over the end rib rings, the seal cases being configured to capture the rib rings therein such that the rib rings cannot move axially away from the outer race and further being secured to the outer race to unitize the bearing for handling purposes; and sealing means on the seal cases for cooperating with the inner race to form barriers at the ends of the bearing.

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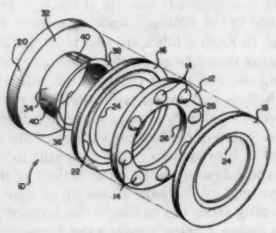
**4,336,972**

## UNITIZED BEARING ASSEMBLY

**Richard T. Dagiel, Elk Grove Village, Ill., assignor to Aetna Bearing Company, Chicago, Ill.**

**Filed Mar. 27, 1980, Ser. No. 134,743**
**Int. Cl.³ F16C *19/00***
**U.S. Cl. 308—233** **2 Claims**



1. A unitized bearing assembly comprising: an annular retainer for arcuately positioning ball bearings in freely rotatable relationship and having a central aperture; a plurality of ball bearings assembled with said retainer; a pair of axially spaced race members, one said race member being disposed on each side of said retainer and engaging said ball bearings in rolling relationship, each said race member defining respective central apertures; and an assembly member including a radially extending, annular shoulder portion confronting one of said races in load-bearing relationship, a central aperture formed in said shoulder portion and defining a circular edge, and a cylindrical sleeve extending axially from said edge to define a shaft-receiving bore, said assembly member being fabricated from a resilient plastic material, and having one or more axially extending slots formed in said sleeve, said slots opening to the end of said sleeve remote from said shoulder portion, said end further including abutment means thereon confronting said shoulder, with said race members and said retainer member being snapped fitted over said sleeve, with said sleeve being received in the central apertures of said retainer and said race members, said sleeve flexing resiliently to permit said snap-fit assembly, with said abutment means engaging the other of said race members, such that said shoulder portion and said abutment means serve to maintain said race members and said retainer member on said sleeve and assembled, yet freely moveable relationship to enhance the friction reducing properties of said bearing.

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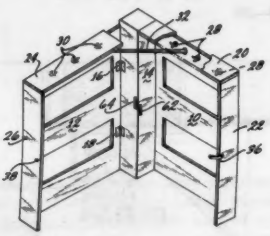
**4,336,973**

## FOLDING CLOTHES HANGER

**Young Bae, 1947 S. Sherbourne Dr., No. 3, Los Angeles, Calif. 90034**

**Filed Aug. 4, 1980, Ser. No. 175,336**
**Int. Cl.³ A47B *43/00, 87/00***
**U.S. Cl. 312—199** **10 Claims**



1. A folding clothes hanger including
a first wall member having a particular width,
at least one clothes hanger mounted on the first wall member at an upper position along the width,
a second wall member having a particular width,
at least one clothes hanger mounted on the second wall member at an upper position along the width, and
a central post portion for supporting the wall members at physically spaced positions and with both the first and second wall members extending from and attached to the central post portion at angularly spaced positions and with at least one of the first and second wall members pivotably mounted to the central post portion for providing for at least a closed position with the first and second wall members lying substantially parallel to and spaced from each other and an upright open position with the first and second wall members lying at an angular relationship to each other and with the clothes hanger supported in the upright open position by the wall members.

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**4,336,974**

## COAXIAL ROTARY JOINT

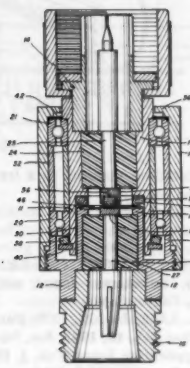
**Ronald A. Wilson, Medway, Mass., assignor to Microwave Development Labs. Inc., Needham, Mass.**

**Continuation-in-part of Ser. No. 959,863, Nov. 13, 1978, abandoned. This application Feb. 13, 1980, Ser. No. 121,269**
**Int. Cl.³ H01R *5/02***
**U.S. Cl. 339—8 R** **22 Claims**

1. A rotary coaxial electrical connector associated with inner and outer coaxial conductors and comprising:
means defining a first member having a pair of conductive contacts supported thereby and associated respectively with said inner and outer conductors,
means defining a second member having a pair of conductive means supported thereby and associated respectively with said inner and outer conductors,
means intercoupling the first and second members in axial position but permitting relative rotation therebetween,
and conductive and resilient spring means including inner and outer contact springs positioned respectively intermediate the conductive contacts and conductive means making electrical contact therebetween, each contact spring including a bowed surface member for contacting the associated conductive contact,
said spring means being constructed of a relatively hard, wear resistant conductive metal substrate covered with a

highly electrically conductive, less wear-resistant metal layer,

whereby said spring means has, after a period of wear-in, a segment of the metal layer worn away to provide direct contact at said segment between the metal substrate and the conductive contact, providing, however, about the



segment direct contact between the metal layer and the conductive contact thus providing a low noise contact,

said contact springs both being supported between the conductive contacts and conductive means in a free floating position and secured substantially only by the spring compressing forces imposed via said conductive contacts and conductive means.

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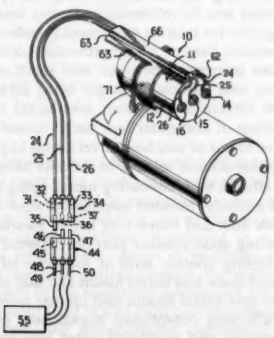
**4,336,975**

## AUTOMOTIVE ELECTRICAL HARNESS

**Ronald C. Casteel, 2891 Glen Echo Dr., Lizella, Ga. 31052**

**Filed Mar. 27, 1980, Ser. No. 134,421**
**Int. Cl.³ H01R *11/32***
**U.S. Cl. 339—28** **11 Claims**



1. The combination of an electric powered automotive engine starter, an automotive engine starter electrical solenoid, an automotive electrical power source and a harness, said harness being carried by said electrical solenoid and including a body, said body including means for securing said harness to said automotive engine starter solenoid, at least one electrical conductor carried by said body and terminating in opposite free end portions, one of said free end portions defining a first electrically conductive terminal, said first electrically conductive terminal being connected to an associated electrical terminal of said automotive engine starter solenoid, another of said free end portions defining a second electrically conductive terminal, said second electrically conductive terminal being of the quick disconnect type, and said first quick disconnect conductive terminal being electrically connected to said automotive electrical power source.

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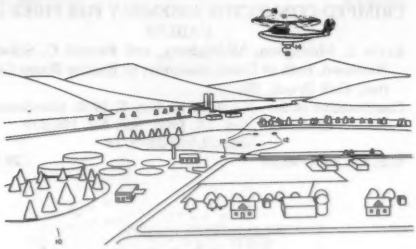
**4,336,976**

## HOLOGRAPHIC STORAGE OF TERRAIN DATA

**Alfred H. Rodemann, Maitland, and Denis R. Breglia, Altamonte Springs, both of Fla., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.**

**Filed Jul. 20, 1979, Ser. No. 59,922**
**Int. Cl.³ G03H *1/26***
**U.S. Cl. 350—3.75** **4 Claims**



1. A method for the holographic storage of terrain data for use as a visual data base in a flight simulator utilizing a holographic retrieval system, comprising the steps of:

selecting as a terrain surface an area of real world terrain;

defining a set of points forming a matrix of perspective points, each point being vertically displaced a predetermined distance above said terrain surface and being horizontally displaced a known distance from all other points of said matrix having a like vertical displacement from said terrain surface;

recording on a photographic film a plurality of photographic images, each of which is a recording of said terrain surface made at one point of said matrix;

generating a collimated monochromatic laser light beam;

splitting said collimated monochromatic laser light beam into a reference laser light beam and an object laser light beam;

expanding said reference laser light beam to a predetermined cross-sectional area so that said expanded reference laser light beam may be directed onto a holographic recording material;

filtering said expanded reference laser light beam so as to minimize the coherent noise therein;

expanding said object laser light beam to a predetermined cross-sectional area so that said expanded laser light beam may be directed onto said photographic film and transmitted therethrough;

filtering said expanded object laser light beam so as to minimize the coherent noise therein;

directing said expanded reference laser light beam onto said holographic recording material;

directing said expanded object laser light beam onto said photographic film wherein said expanded object laser light beam is transmitted through said photographic film;

directing said expanded object laser light onto said holographic recording material thereby interfering said expanded reference laser light beam and said expanded object laser light beam for recording on said holographic recording material a hologram based on an interference pattern associated with one of said photographic images;

adjusting with fine tuning the position of said photographic film so as to allow for the recording of each of the photographic images thereon upon said holographic recording material;

varying the location at which said expanded object and reference laser light beams are directed onto said holographic recording material; and

varying the angle of inclination of said holographic recording material such that several holograms may be multiplexed upon each location of said holographic recording material, with each location of said holographic recording material having recorded thereon the holograms of one of the matrix of perspective points of said terrain surface.

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4,336,977

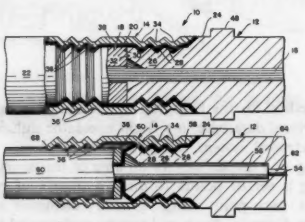
## CRIMPED CONNECTOR ASSEMBLY FOR FIBER OPTIC CABLES

Kevin J. Monaghan, Middlebury, and Russell C. Schwickert, Newtown, both of Conn., assignors to Bunker Ramo Corporation, Oak Brook, Ill.

Continuation of Ser. No. 939,519, Sep. 5, 1978, abandoned. This application Sep. 24, 1980, Ser. No. 190,279

Int. Cl.³ G02B 5/14

U.S. Cl. 350—96.20 29 Claims



1. A connector assembly for one or more single optical fibers of a fiber optic cable or the like which has a strength member therein, comprising:

a connector body for receiving said one or more single optical fibers of the fiber optic cable, said connector body having a rear end portion over which the strength member of said fiber optic cable is positionable, said rear end portion being provided with one or more annular crimp receiving grooves;

a ferrule member positionable over the grooved rear end portion of said connector body for crimpting said strength member between the ferrule member and the grooved rear end portion of said connector body, said ferrule member having one or more ribs nested in the grooves of said connector body after crimping, and wherein

each of said grooves cooperates with one of said ribs to provide a plurality of crimping diameters therebetween.

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4,336,978

## METHOD FOR OPTICALLY MAKING A DIFFUSION PLATE

Takashi Suzuki, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 20, 1979, Ser. No. 105,884

Claims priority, application Japan, Dec. 26, 1978, 53/164147; Dec. 27, 1978, 53/165863

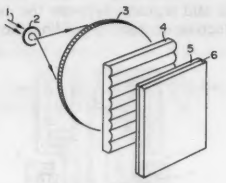
Int. Cl.³ G02B 5/02

U.S. Cl. 350—167 6 Claims

1. A method for optically making a diffusion plate comprising the steps of:

illuminating an object having a regular macrostructure and an irregular microstructure with coherent light;

directing the light coming from said object without imaging said objects, onto a recording material to form a speckle pattern thereon; and



subjecting said recording material to a treatment so as to obtain a diffusion plate.

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4,336,979

## MOUNTING SYSTEM FOR OPTICAL LENS ASSEMBLY

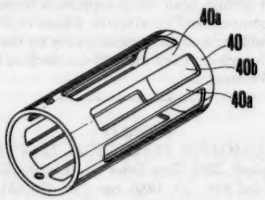
Masahide Hamatani, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 5,465, Jan. 22, 1979, Pat. No. 4,269,479. This application Feb. 18, 1981, Ser. No. 235,703

Claims priority, application Japan, Feb. 2, 1978, 53-11728[U]

Int. Cl.³ G02B 7/04

U.S. Cl. 350—255 7 Claims



1. In a mounting mechanism for an optical system of lenses including inner lens barrel means and outer lens barrel means coupled together for relative movement therebetween in longitudinal directions thereof, the improvement comprising lubricating means interposed between said inner and outer lens barrel means, said lubricating means being arranged between the external surface of said inner lens barrel means and the internal surface of said outer lens barrel means and being affixed relative to one of said lens barrel means to prevent at least axial movement thereof relative to the lens barrel means upon which it is affixed, said lubricating means being constructed in the form of a tubular member inserted between said inner lens barrel means and said outer lens barrel means, said tubular member having slide contact portions adapted to engage in lubricated sliding contact with at least one of said external surface of said inner lens barrel means and said internal surface of said outer lens barrel means, said tubular member including means for effecting compressed engagement of said tubular member between said inner and outer lens barrel means in order to provide a resilient force acting therebetween.

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4,336,980

## FLUORESCENT LIQUID CRYSTAL DISPLAY DEVICES

Fumiaki Funada, Yamatokoriyama; Masataka Matsuura, Tenri, and Tomio Wada, Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Feb. 13, 1980, Ser. No. 120,994

Claims priority, application Japan, Feb. 15, 1979, 54-16842

Int. Cl.³ G02F 1/13

U.S. Cl. 350—345 3 Claims

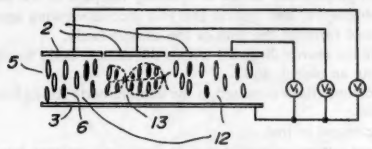
1. A transformation-type display device comprising liquid crystal mixtures inclusive of a fluorescent material comprising:

a pair of electrodes;

a pair of substrates, each carrying one of said electrodes;

A liquid-crystal mixture containing fluorescent material dissolved or dispersed therein supported by said pair of substrates, said liquid-crystal mixture comprising a cholesteric liquid-crystal material formed in focal-conic textures in a cholesteric mesophase at a display area and in homeotropic orientation in a nematic mesophase at a background area opposed to said display area; and

means for placing said liquid-crystal mixture in such a molecular orientation that, in a selected portion of the pair of electrodes, the fluorescent material generates no fluorescence and, accordingly, no fluorescence penetrates through the liquid-crystal mixture.

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## 4,336,981

## SIMULTANEOUS MULTI-BEAM OPTICAL MODULATION SYSTEM

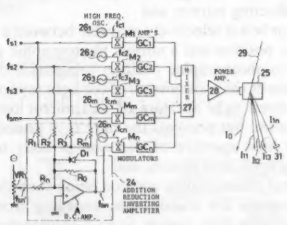
**Masaaki Mori, Kawasaki, Japan, assignor to Ricoh Co., Ltd., Japan**

**Division of Ser. No. 954,533, Oct. 25, 1978, Pat. No. 4,269,482. This application Jul. 25, 1980, Ser. No. 172,148**

**Claims priority, application Japan, Oct. 25, 1977, 52-127857**

**Int. Cl.³ H04B 9/00**

**U.S. Cl. 350—358** **7 Claims**




1. In a simultaneous multi-beam optical modulation system having a signal source for producing a plurality of image signals, a plurality of amplitude modulators connected to the signal source each for modulating one of the image signals, a high-frequency carrier oscillator connected to each of the modulators for producing a carrier to modulate each image signal, and an acoustic optical element for deflecting light connected to each of the amplitude modulators for producing a plurality of output light beams each corresponding to one of the image signals, the improvement comprising, addition-reduction inverting means connected to the signal source for receiving each of the image signals, setting voltage means connected to said addition-reduction inverting means for supplying a setting voltage which is of opposite polarity to the image signals, the signal voltage being applied to said addition-reduction inverting means, said setting voltage being provided for setting an overall deflection efficiency of the acoustic optical element, means in said addition-reduction inverting means for adding said setting voltage to the image signals to produce a sum and inverting said sum to produce a dummy signal, an assigned amplitude modulator connected to said addition-reduction inverting means for receiving said dummy signal, a high-frequency carrier connected to said assigned amplitude modulator for modulating said dummy signal and gain control means connected between each of said amplitude modulators and the acoustic optical element for adjustably amplifying each of said modulated image signals to equalize the intensity of the output light beams produced by the acoustic optical element.

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## 4,336,982

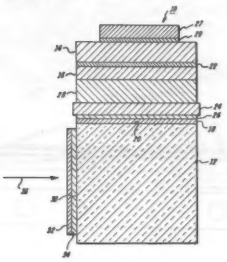
## $MGF_2$ COATING FOR PROMOTING ADHERENCE OF THIN FILMS TO SINGLE CRYSTAL MATERIALS

**Malcolm B. Rector, Jr., Arcadia, Calif., assignor to Xerox Corporation, Stamford, Conn.**

**Filed Aug. 4, 1980, Ser. No. 174,972**

**Int. Cl.³ G02F 1/11**

**U.S. Cl. 350—358** **6 Claims**



1. An acousto-optic device comprising:

a single crystal material having at least first and second surfaces:

a transducer element;

an adhesion promoting layer of magnesium fluoride overlying said first crystal surface;

a layer of bonding material interposed between said transducer element and said adhesion promoting layer; and

means for electrically driving said transducer element whereby an elastic wave is produced in said crystal material.

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## 4,336,983

## PHOTOGRAPHIC OBJECTIVE STABILIZED AGAINST CHANGE OF ANGULAR FIELD DURING FOCUSING

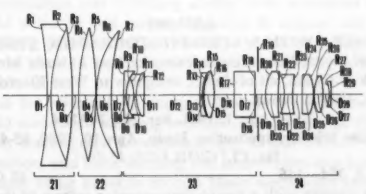
**Kazuo Tanaka, Tokyo, and Sadahiko Tsuji, Yokohoma, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan**

**Filed Dec. 19, 1979, Ser. No. 105,089**

**Claims priority, application Japan, Nov. 25, 1978, 53-163546; Nov. 20, 1979, 54-150244**

**Int. Cl.³ G02B 15/18**

**U.S. Cl. 350—427** **3 Claims**




1. A photographic object having an angular field prevented from varying during focusing, comprising:

a first lens group, counting from the front of the lens, movable for focusing;

a second lens group and a third lens group which are stationary during focusing; and

a diaphragm arranged between said second lens group and

said third lens group, and a back focal point of combined lens system of said second and third lens groups being made coincident with the point of the exit pupil of the entire lens system so that the change of angular field in the object space during focusing is reduced.

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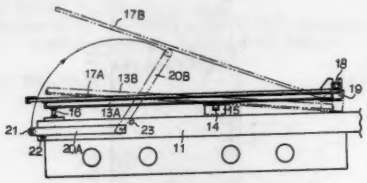
**4,336,984**

## APPARATUS FOR HOLDING A COPY IN REPRODUCTION CAMERA

**Shozi Komatsubara, and Masanori Katayama, both of Hikone, Japan, assignors to Dainippon Screen Mfg. Co., Ltd., Kyoto, Japan**

**Filed Apr. 11, 1980, Ser. No. 139,170**
**Claims priority, application Japan, May 4, 1979, 54-59813[U]**
**Int. Cl.³ G03B *27/62***
**U.S. Cl. 352—75** **5 Claims**




1. An apparatus for positioning a copy in a reproduction camera having an optical axis inclined from the vertical, said copy positioned in a horizontal position for set-up and in an inclined position perpendicular to said optical axis during exposure, comprising:

carrier means mounted for axial movement along said optical axis;

holding means mounted on said carrier means for receiving said copy;

means for pivotally connecting said carrier means to said holding means so that said holding means pivots on said carrier means with respect to said optical axis;

cover means mounted on said holding means for securing said copy flat against said holding means for exposure in a closed position and for permitting removal of said copy from said holding means for set-up in an open position; and

mounting means for pivotally connecting said holding means to said cover means so that the centroid of said cover means, said holding means, and said mounting means is located between said pivotal means and said mounting means when said cover means is in said open position and opposite said mounting means and said pivotal means when said cover is in said closed position.

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**4,336,985**

## CAMERA WITH MACRO-PHOTOGRAPHIC SYSTEM

**Hiroshi Iwata, Nara; Tetsuo Yamaoka, and Akitoshi Morioka, both of Osaka, all of Japan, assignors to West Electric Co., Ltd., Osaka, Japan**

**Filed Apr. 1, 1981, Ser. No. 249,884**
**Claims priority, application Japan, Apr. 10, 1980, 55-47870**
**Int. Cl.³ G03B *3/00, 15/05***
**U.S. Cl. 354—145** **10 Claims**

1. A camera with a macro-photographic system of the type including

a plurality of light apertures formed through a wall of a camera body for admitting the light rays from an object into the camera body,

a macro-photographic lens system optically coupled to a first one of said light apertures,

a standard photographic lens system optically coupled to a second one of said light apertures,

a lens system selection means for selecting either the macro-photographic lens or the normal photographic lens,

a first viewfinder system which is used in the case of macro-photography and which is optically coupled to the macro-photographic lens system and to a first viewing aperture formed through a wall of the camera body,

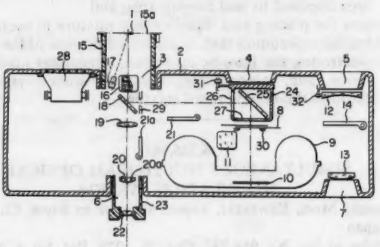
a second viewfinder system which is used in the case of normal photography and which is optically coupled to the normal photographic lens system and to a second viewing aperture formed through the wall of the camera body,

a luminous source disposed within the camera body for illuminating an object, and

an electronic flash disposed in the camera body for lighting an object,

characterized in that

said lens system selection means includes a mirror box (24) with a first light aperture through which pass the light rays emerging from the macro-photographic lens system, a re-




flecting mirror for totally reflecting the light rays passed through the first aperture of the mirror box and a second light aperture through which pass the light rays reflected by said reflecting mirror; and

said mirror box is selectively movable between a macro-photographic position and a normal photographic position,

said macro-photographic position being such that the mirror box permits the transmission of the light rays passed through said second light aperture of said mirror box to a shutter mechanism, but prevents the light rays passed through said second light aperture of said camera body to said normal photographic lens system, and

said normal photographic position being such that said mirror box prevents the transmission emerging from the macro-photographic lens system to said shutter mechanism, but permits the transmission of the light rays passed through said second light aperture of said camera body to said normal photographic lens system.

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**4,336,986**

## CAMERA HAVING AN INDEPENDENTLY FOCUSED RETRACTABLE OBJECTIVE LENS

**Claus Prochnow, Brunswick, Fed. Rep. of Germany, assignor to Rollei-Werke Franke & Heidecke GmbH & Co. KG, Brunswick, Fed. Rep. of Germany**

**Filed Jul. 2, 1980, Ser. No. 164,497**
**Claims priority, application Fed. Rep. of Germany, Sep. 4, 1979, 2935588**
**Int. Cl.³ G03B *3/00, 17/04***
**U.S. Cl. 354—187** **8 Claims**

1. A camera including a camera housing, an objective lens having an image axis and a shutter release mechanism, said camera further including:

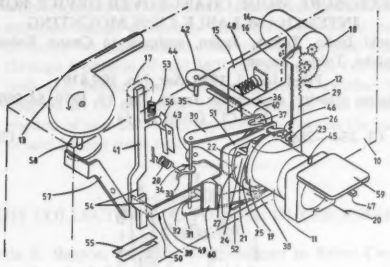
means for setting a focal range of said camera;

means for mounting said objective lens for movement substantially parallel to said image axis, between an extended exposure position and a retracted storage position;

means for variably limiting axial movement of said mounting means in said extended position;

means, responsive to said range setting means, for varying said limiting means; and

means for variably biasing said mounting means towards said extended position, such that said mounting means is less



strongly biased toward said extended position during operation of said varying means and more strongly biased toward each extended position during operation of shutter release mechanism.

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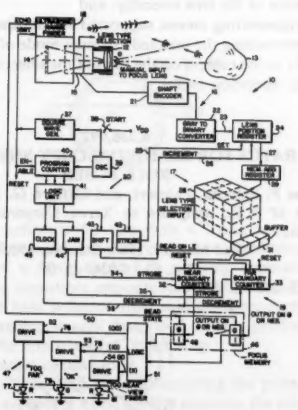
**4,336,987**

## CAMERA EMPLOYING ZONE FOCUSING

**Edwin K. Shenk, Westford, Mass., assignor to Polaroid Corporation, Cambridge, Mass.**

**Filed Dec. 22, 1980, Ser. No. 218,813**
**Int. Cl.³ G03B 3/10**
**U.S. Cl. 354—195** **28 Claims**



**1.** In photographic apparatus having a movable lens whose position at which a subject is in focus is a function of subject distance, means for sensing the position of the lens, and ranging means for determining the distance of a given subject from the apparatus, the improvement comprising:

means for determining, in accordance with the sensed position of the lens, a focal zone defining a range of distances within which a subject must be located to be properly focused when the lens is in the sensed position; and

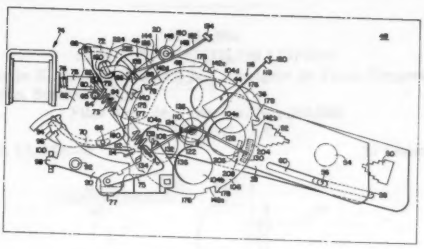
means for comparing the subject distance to said focal zone and for providing an error signal indicative of the relationship between the subject distance and said zone.

**4,336,988**

## CAMERA WITH LENS DISC DRIVE SYSTEM

**Bruce K. Johnson, Andover, Mass., assignor to Polaroid Corporation, Cambridge, Mass.**

**Filed Jan. 2, 1981, Ser. No. 222,011**
**Int. Cl.³ G03B 13/18, 9/08**
**U.S. Cl. 354—197** **8 Claims**



**1.** A camera having means for defining a film plane, said camera comprising:

a plurality of discrete lens elements each having a different focal length;

means for holding said plurality of lens elements in circumferentially spaced apart relation with respect to each other for rotation about a center axis, rotation of said lens holding means from an initial position operating to sequentially move each of said lens elements into position to focus an image onto the camera film plane of a photographic subject located within a different corresponding camera-to-subject distance range;

a blade mechanism;

means for mounting said blade mechanism for displacement between one arrangement in which said blade mechanism blocks transmission of scene light to the film plane and another arrangement in which said blade mechanism unblocks transmission of scene light to the film plane;

actuable drive means for displacing said blade mechanism between its said one and another arrangements to define an exposure interval;

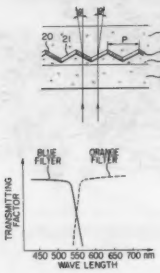
a torsion spring having an acceleration arm configured to be releasably held at cocked energy storing initial position and upon release to move to a terminal position, said acceleration arm operating during such movement from said initial to said terminal position to engage said lens holding means and effect rotation thereof to sequentially move each of said lens elements into focusing position; and

means for releasably latching said blade mechanism in its said scene light blocking arrangement and also for releasably holding said acceleration arm in said cocked initial position, said blade latching and acceleration arm holding means being movable from a blade mechanism latching position to a blade mechanism unlatching position to enable said drive means to displace said blade mechanism between said blocking and said unblocking arrangements, said movement from said latching to said unlatching position simultaneously operating to release said acceleration arm for movement from said initial cocked position to said terminal position to effect rotation of the lens holding means.

## 4,336,989
## FOCUSING SCREEN

Susumu Matsumura, Kawasaki, and Takashi Suzuki, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 24, 1980, Ser. No. 209,491
Claims priority, application Japan, Nov. 29, 1979, 54-154727; Nov. 29, 1979, 54-154728
Int. Cl.³ G03B *13/24*
U.S. Cl. 354—200 8 Claims



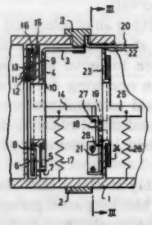

1. In a coincidence type range finder system having an objective lens for forming an image in a primary image plane, a focusing screen for indicating the focus condition of the image comprising:

a light diffracting means comprising a plurality of optically asymmetric unit structures periodically arranged substantially in said plane, said light diffracting means diffracting light components of different wavelengths of the incident light beam from said objective lens in different directions, whereby when said objective lens does not form the image on said plane, a plurality of images colored in different colors are viewed in the range finder.

## 4,336,990
## DIAPHRAGM CONTROL SYSTEM

Werner Flöther, Aalen, Fed. Rep. of Germany, assignor to Carl Zeiss-Stiftung, Oberkochen, Fed. Rep. of Germany

Filed Nov. 4, 1980, Ser. No. 203,995
Claims priority, application Fed. Rep. of Germany, Nov. 7, 1979, 2944888
Int. Cl.³ G03B *9/02, 7/20*
U.S. Cl. 354—272 5 Claims

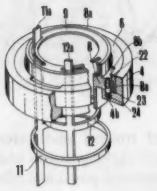


1. A diaphragm control system for a diaphragm forming part of an interchangeable assembly for mounting on a camera of the type having automatic diaphragm aperture setting mechanism, said diaphragm including blades movable to vary the aperture of the diaphragm and a slotted ring member rotatable for moving said blades, said control system comprising a control finger member mounted on said assembly and engaging with the automatic diaphragm aperture setting mechanism of the camera on which the assembly is mounted, said finger member being operatively connected to said ring member, and means for converting a linear movement of one of said members into a non-linear movement of the other of said members.

## 4,336,991
## EXPOSURE MODE CHANGEOVER DEVICE FOR INTERCHANGEABLE LENS MOUNTING

Takashi Isobe, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 3, 1980, Ser. No. 109,419
Claims priority, application Japan, Jan. 19, 1979, 54-5808[U]
Int. Cl.³ G03B *17/14*
U.S. Cl. 354—286 7 Claims



1. An interchangeable lens assembly capable of changing the exposure mode thereof between a first exposure mode and a second exposure mode comprising:

(a) lens barrel means having coupling means for engagement with complementary coupling means of a camera to mount the interchangeable lens assembly on the camera;

(b) adapter means arranged to be rotatable relative to the lens barrel means, the adapter means and the lens barrel means being arranged to maintain a predetermined spatial relationship therebetween when the interchangeable lens assembly is detached from the camera;

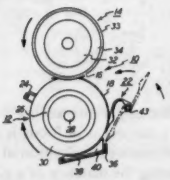
(c) operation means for enabling selective changeover between the first exposure mode and the second exposure mode of the lens assembly; and

(d) transmitting means, supported by the adapter means, for transmitting the selected exposure mode of the lens assembly to the camera on the basis of the selecting operation of the operation means.

## 4,336,992
## APPARATUS FOR REMOVING COPY SHEETS FROM A ROLL FUSER

Thomas F. Szlucha, Fairport, and Clifford O. Eddy, Webster, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed May 19, 1980, Ser. No. 150,767
Int. Cl.³ G03G *15/00*
U.S. Cl. 355—3 FU 4 Claims



1. In a roll fuser apparatus comprising a deformable fuser roll and a heat source for elevating the surface temperature thereof, said fuser roll cooperating with a backup roll to form a nip through which copy sheets carrying toner images pass with the images contacting the heated fuser roll, and further comprising apparatus for separating said sheets from said heated fuser roll, the improvement comprising:

at least one flexible stripper member supported in contact with said heated fuser roll;

a stationary support shaft supporting said stripper member for 360° of rotation about said shaft and supporting said at least one flexible stripper member radially immovable with respect to said shaft, said at least one flexible stripper member being sufficiently flex ible whereby it can be deflected by said heated fuser roll and rotated thereby through a portion of said 360° and moved ou t of contact with said heated fuser roll, said stripper member being adapted to be manually rotated through the remaining portion of said 360° whereby it again contacts the surface of said heated fuser roll.

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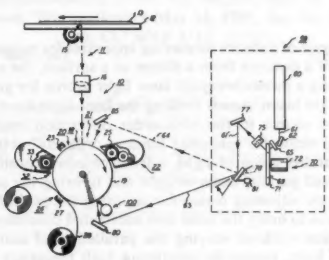
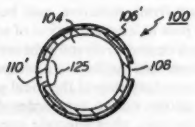
4,336,993

## LIGHT COLLECTOR ROD FOR USE IN XEROGRAPHIC SYSTEMS

Martin E. Banton, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Sep. 2, 1980, Ser. No. 183,122
Int. Cl.³ G03G *15/00*
U.S. Cl. 355—3 R 5 Claims






1. A light collector for use with a flying spot scanner adapted to raster scan images developed on the photoconductive surface of a xerographic type copying apparatus, said collector being disposable opposite said photoconductive surface to collect light reflected from said photoconductive surface when scanning images developed on said photoconductive surface, the improvement comprising:

(a) a transparent central core;

(b) a layer of cladding material covering the periphery of said core except for a first slit-like aperture, the axis of said first aperture extending in a direction substantially parallel to the axis of said core;

(c) a layer of light diffusing material covering the outer periphery of the portion of said core exposed at said first aperture and covering the outer periphery of said cladding material except for a second slit-like aperture substantially opposite said first aperture, said second aperture extending in a direction substantially parallel to the axis of said core and permitting light reflected from said photoconductive surface to enter said collector; and

(d) a photosensor at at least one end of said collector, said photosensor being operatively coupled to said collector to enable said photosensor to sense light transmitted axially along said core whereby to provide image signals representative of the image scanned,

light reflected from said photoconductive surface passing through said second aperture and said cladding material and through said core to strike said light diffusing material at said first aperture, said light diffusing material diffusing said light and reflecting said light back into said core, a portion of the diffused light in said core being reflected by said cladding material axially along said core to said photosensor.

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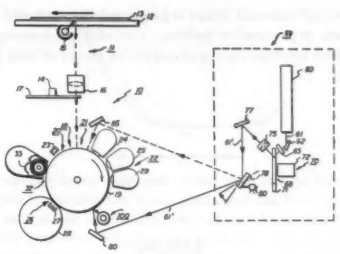
4,336,994

## MULTI-MODE COLOR COPIER

Martin E. Banton, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Nov. 24, 1980, Ser. No. 210,086
Int. Cl.³ G03G *13/01*
U.S. Cl. 355—4 13 Claims



1. A multi-mode color copier having a photoconductive member defining multiple picture elements for recording electrostatic images, said copier comprising:

(a) multiple filter means for transmitting multiple color separated images from an original to the photoconductive member,

(b) multiple developer means for developing picture elements on said photoconductive member, one of said multiple developers for developing each of said multiple color separated images,

(c) means for sequentially transferring developed color separated images from said photoconductive member to a copy sheet to form a composite color image on said copy sheet,

(d) scanning input means for scanning color developed picture elements comprising said photoconductive member and generating color separated video signals for each of said picture elements, and

(e) scanning output means for creating color separated latent images on said photoconductive member for development by said multiple developer means prior to transfer to copy sheet by said means for transferring or prior to scanning by said scanning input means.

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4,336,995

## PRECESSION SCANNING SYSTEM FOR COPIER DEVICE

John A. Durbin, Webster, and David K. Shogren, Ontario, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

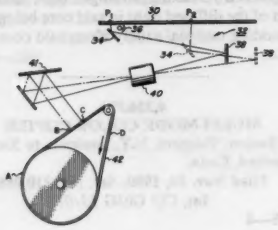
Filed Sep. 24, 1980, Ser. No. 190,160
Int. Cl.³ G03G *15/28*
U.S. Cl. 355—8 8 Claims

1. A scanning system for projecting light images of a stationary object at an object plane along an optical path onto a flat photoreceptor in an image plane including

means for moving said photoreceptor at a first rate of speed $V_3$,

illumination means adapted to scan said object at a second rate of speed $V_1$ greater than that of said photoreceptor speed, and

a scanning projection lens positioned along the optical path between said illumination means and said photoreceptor, and moving at a third rate of speed $V_2$ less than said first and second rates,



whereby said scanned image is projected through said lens and imaged, in precession fashion, onto said photoreceptor in a direction opposite to the direction of travel of said photoreceptor.

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**4,336,996**

## VARIABLE-FOCAL-LENGTH OBJECTIVE AND AN OPTICAL SYSTEM EQUIPPED WITH OBJECTIVES OF THIS TYPE FOR THE PRODUCTION OF SPECIAL EFFECTS ON FILM

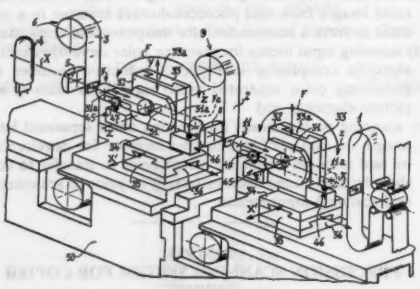
**Claude Cattelani, 1, Square de la Mayenne, F-75017 Paris, and Catherine Perichon, 5, Square de la Beauce, F-77100 Meaux/-Beauval, both of France**

**Filed Jul. 25, 1980, Ser. No. 172,639**

**Claims priority, application France, Mar. 12, 1980, 80 05519**

**Int. Cl.³ G03B *27/32, 27/52;* G02B *9/00, 15/18***

**U.S. Cl. 355—39** **6 Claims**



2. An optical system for the production of special effects on an unexposed film, constituting an optical printer or caption stand and comprising at least one objective associated with means for projecting at least one exposed film on the unexposed film in order to obtain special effects, wherein at least one of the objectives is constituted by four groups of lenses, viz:

a first convergent group of four lenses,

a second divergent group of four lenses,

a third convergent group of six lenses,

a fourth convergent group of two lenses, the first and third groups being coupled together and movable.

**4,336,997**

## CHANGE OF DISTANCE MEASURING APPARATUS

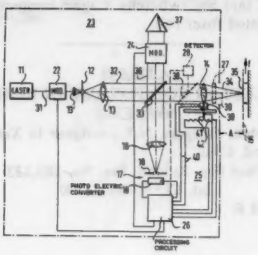
**Dieter Röss, Planegg, and Viktor Baumgartner, Taufkirchen, both of Fed. Rep. of Germany, assignors to Erwin Sick GmbH Optik-Electronik, Waldkirch, Fed. Rep. of Germany**

**Filed Feb. 27, 1980, Ser. No. 125,209**

**Claims priority, application Fed. Rep. of Germany, Mar. 6, 1979, 2908757**

**Int. Cl.³ G01C *3/08;* G01B *11/30***

**U.S. Cl. 356—4** **14 Claims**



1. Change of distance measuring apparatus for measuring the change of a distance from a datum to a surface, the apparatus comprising a monochromatic laser light source for generating a laser light beam, means limiting the laser light beam emitted from said source to the zero order diffraction beam, beam widening means for spreading the zero order diffraction beam into a parallel beam of light, a front objective positioned to receive said parallel beam of light and to bring the same to a point focus, adjusting means for adjusting the position of said point focus to bring the same into substantial coincidence with said surface without varying the parallelism of said parallel beam of light, means for producing high frequency cyclical variation of the position of said point focus without disturbing the parallelism of said beam of light, beam dividing means located in said parallel beam of light between said beam widening means and said front objective, said beam dividing means being adapted to pass at least a fraction of said parallel beam of light to said objective and to direct light returned through said front objective from said surface to a second objective, means defining a modal aperture stop at the focal plane of said second objective which allows only a zero order diffraction image of the light source to pass, photoelectric converter means positioned to receive light from said zero order diffraction image and an electronic processing circuit for processing signals derived from said photoelectric converter means to produce a control signal for said adjusting means to bring said point focus into substantial coincidence with said surface.

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**4,336,998**

## FINGERPRINT TRANSDUCER AND READING APPARATUS

**Hartwig Ruell, Mt. Laurel, N.J., assignor to Siemens Corporation, Iselin, N.J.**

**Filed May 22, 1980, Ser. No. 152,514**

**Int. Cl.³ G06K *7/10, 9/00***

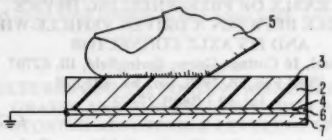
**U.S. Cl. 356—71** **14 Claims**

1. In an apparatus for the identification of fingerprints having a fingerprint sensing member with a sensing surface and having means for interrogating with a light beam a fingerprint relief impressed onto the sensing surface, whereby the light beam is modulated in accordance with the structure of the fingerprint, the improvement comprising:

the sensing surface being made of an insulating material having a softening temperature greater than ambient temperature and which will deform when a finger is pressed thereon to form the fingerprint relief;

means for imparting a non-uniform electrostatic charge distri-

bution to the sensing surface in accordance with the fingerprint relief; and




means for heating the sensing surface so that the material softens and produces an enhanced fingerprint relief in response to the electrostatic forces exerted by the electrostatic charge.

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**4,336,999**

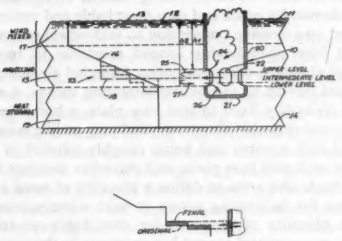
## SELECTIVE MIXER FOR SOLAR POND AND METHOD OF USING SAME

**Gad Assaf, Rehovot, Israel, assignor to Solmat Systems, Ltd., Yavne, Israel**

**Continuation-in-part of Ser. No. 889,987, Mar. 24, 1978, abandoned. This application May 14, 1980, Ser. No. 149,564**

**Int. Cl.³ B01F** *5/12, 13/02*

**U.S. Cl. 366—101** **45 Claims**






**1**. A method for modifying the vertical density profile of a halocline in a solar pond comprising the steps of inserting into the pond a chamber having vertically oriented opening means which defines a preselected layer of the halocline having a density that increases monotonically with depth and which connects the interior of the chamber to the layer, and mixing the water in the chamber to establish a uniform density therein whereby the vertical variation in density across the opening means between the water inside and outside the chamber establishes a pressure differential that varies vertically and which causes water in the layer to flow into and out of the chamber.

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**4,337,000**

## TWO-SPINDLE PLANETARY KITCHEN MIXER-KNEADER AND ANTI-CLIMB DOUGH HOOKS THEREFOR

**Herbert G. Lehmann, 5 Kent Rd., Easton, Conn. 06612**

**Filed Jun. 4, 1981, Ser. No. 270,401**

**Int. Cl.³ B01F** *9/22, 7/16*

**U.S. Cl. 366—288** **9 Claims**

**1**. A planetary kitchen mixer-kneader, comprising in combination:

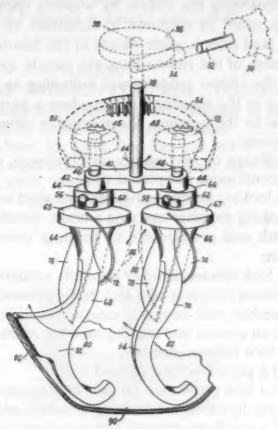
(a) a rotary head mounted for rotation about a vertical axis,

(b) a fixedly mounted gear having teeth, and having the same axis as the vertical axis of the rotary head,

(c) power means including gearing, for rotating said rotary head,

(d) a pair of vertical spindles turnably mounted in the rotary head and having pinions meshing with the teeth of the fixed gear to effect like-direction turning of the spindles as the head is rotatably driven,

(e) a pair of dough hooks respectively carried by said spindles, and



(f) a mixing bowl disposed about said dough hooks, said hooks traversing the inside surface of the bowl in an orbital path as the head turns, and said hooks having laterally-offset portions which are complementary in providing clearance between the hooks during the like-direction turning of the latter.

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**4,337,001**

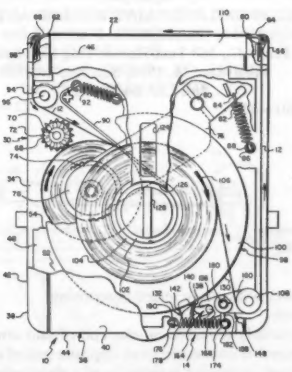
## RELEASABLE RIBBON LOCKING DEVICE IN A RIBBON CARTRIDGE

**Samuel D. Cappotto, Syracuse, N.Y., assignor to SCM Corporation, New York, N.Y.**

**Filed Jul. 28, 1980, Ser. No. 172,624**

**Int. Cl.³ B41J** *33/14*

**U.S. Cl. 400—208** **4 Claims**



**1**. A releasable ribbon locking device for use in a ribbon cartridge of the type removably mounted in a printing machine, the printing machine having a cartridge support and an actuable ribbon drive means, the cartridge including a housing, a ribbon, a ribbon supply spool having the ribbon wound thereon, a supply spool support mounted in the housing for rotation in an unwinding direction and having the ribbon supply spool rigidly mounted thereon, a ribbon take-up spool

rotatably mounted in the housing, a ribbon feed mechanism located in the housing and operatively connected to the ribbon drive means when the ribbon cartridge is properly positioned on the cartridge support for printing, the ribbon feed mechanism tensioning the ribbon by winding spent ribbon onto the take-up spool in response to actuation of the ribbon drive means, and ribbon guide means in the housing for controlling movement of the ribbon from the supply spool to the take-up spool, the ribbon guide means including an exit and entrance opening in the housing for extending a portion of the ribbon external to the housing, the releasable ribbon locking device comprising:

(a) a flange on said supply spool support, said flange having a continuous peripheral rim;

(b) a locking member pivotally mounted in said housing, said locking member carrying a brake member movable therewith and positionable in abutting relationship with said rim;

(c) a lock release member pivotally mounted in said housing;

(d) means coupling said lock release member to said locking member, said coupling means comprising:

(1) an arm on said locking member extending towards said lock release member;

(2) a pin supported on said arm;

(3) a first projection on said lock release member extending towards said locking member; and

(4) a slot formed on said first projection closely receiving said pin for concomitant movement;

(e) spring means connected to said lock release member and urging said locking member toward said flange to position said brake member in said abutting relationship thereby preventing the unwinding rotation of the supply spool support; and

(f) a ribbon tensioning element supported on said lock release member and in engagement with a portion of said ribbon, said ribbon tensioning element operable to move towards said ribbon supply spool in response to take-up tensioning of said ribbon and through said coupling means said lock release member pivotally moves said locking member against the urging of said spring means for removing said brake member from said supply spool support rim.

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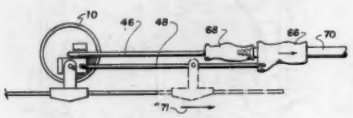
**4,337,002**

## DRIPLESS CEILING PAINT ROLLER AND PAINT METERING PAN

**Martucci Frank C., 360 Tom Hunter Rd., Fort Lee, N.J. 07024**

**Filed Apr. 16, 1980, Ser. No. 140,758**
**Int. Cl.³ B44D *3/28***
**U.S. Cl. 401—15** **8 Claims**




1. A roller with spray guard comprising:

a roller arm;

a roller rotatably mounted on one end of said arm;

a handle member connected to an opposite end of said arm; and

a spray guard consisting essentially of a single planar member pivotally mounted near a bisecting line thereof for free pivotal motion to said arm one end, said guard extending at least the axial length of said roller, said arm having a portion between said roller and said handle member of a length sufficient to permit free pivoting of said guard below said roller whereby said guard pivotally hangs below said roller when in use and extends substantially horizontally when stationary, and so that with motion of said roller from below on a horizontal surface in a painting direction, said guard pivots toward the surface with a trailing edge thereof, said guard mounted closely adjacent said roller.

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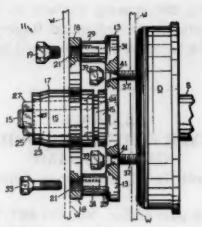
**4,337,003**

## LOCKABLE OR FREE-WHEELING DEVICE INSERTABLE BETWEEN A DRIVEN VEHICLE-WHEEL AND ITS AXLE CONNECTOR

**Barker J. Juhl, 16 Cottage Grove, Springfield, Ill. 62707**

**Filed Feb. 28, 1980, Ser. No. 125,520**
**Int. Cl.³ B60B *27/02***
**U.S. Cl. 403—1** **6 Claims**



1. A device for co-axial insertion between a vehicle wheel and its conventional wheel-mounting means, comprising: a base plate adapted for quick and easy detachable and vertically disposed and co-extensive connection to said wheel-mounting means, said base plate having spaced apertures to receive therethrough standard wheel-mounting threaded elements for attaching said device to said wheel-mounting means, a shaft rigidly and co-axially fixed to said base plate, a hub member surrounding and rotatable about said shaft, a platelike member fixed to said hub member and being roughly parallel to and co-extensive with said base plate, said plate-like member having spaced blade-like arms to define a plurality of open areas therebetween for facilitating access to said wheel-mounting elements, a plurality of elements for detachably co-acting between the conventional spaced lug apertures in the conventional disk-like central portion of a vehicle wheel for fastening said wheel to said plate-like member co-axially with said shaft.

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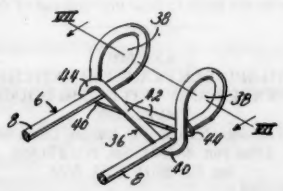
**4,337,004**

## CONNECTOR TERMINUS FOR WIRE MEMBERS

**Donald D. Mundell, and Lloyd E. Tieman, both of Carthage, Mo., assignors to Flex-O-Lators, Inc., Carthage, Mo.**

**Filed Oct. 17, 1980, Ser. No. 197,932**
**Int. Cl.³ F16B *1/00***
**U.S. Cl. 403—209** **11 Claims**




1. A connector terminus formation for an elongated strap comprising a pair of spaced apart, generally parallel first and second body wires, said formation comprising a loop formed in each wire adjacent but spaced apart from its free end generally in a plane at right angles to a plane defined by said body wires but parallel to the longitudinal extent of said strap, said loops being coaxial on an axis parallel to the plane of the body wires but transverse to the general extent of said strap for receiving

a retainer pin therethrough to complete an actual connection of said strap, the extreme end portion of each body wire being trained about the side of the standing portion of itself distal from the other of said body wires and extending transversely of said strap toward said other body wire to form a lever arm, and restricting means inhibiting movement of the free end of each of said lever arms relative to said other body wire.

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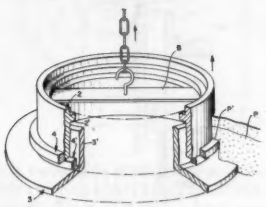
4,337,005

## STRUCTURES FOR SUPPORTING MANHOLE COVERS, GRATES AND THE LIKE PROVIDED WITH SELF-STORING ADJUSTABLE LEVELING APPARATUS

Francis LeBaron, 255 East St., West Bridgewater, Mass. 02324

Filed Feb. 17, 1981, Ser. No. 235,042
Int. Cl.³ E02D *29/14*
U.S. Cl. 404—26 7 Claims



1. Apparatus for providing adjustable leveling of manhole covers, grates and the like within ground and similar structures, having, in combination, a tubular slip ring for supporting a cover, grate and the like near its upper edge, a base ring having a bottom flange mounting a tubular vertical sleeve positioned to receive the slip ring in coaxial telescopic relationship, and resilient spacer ring means fitted under tension coaxially against a wall of the slip ring near its lower edge and adapted, upon lifting of the slip ring along the base ring sleeve, to be forced down and snapped under the said lower end of the slip ring and against the base ring flange, to elevate the level of the slip ring and thus that of the manhole cover, grate and the like.

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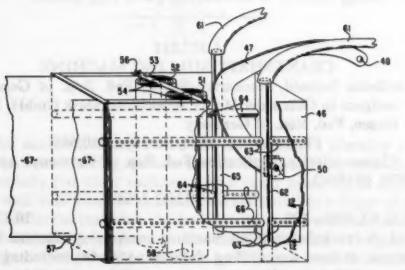
4,337,006

## DEVICE FOR PREPARING AND CLEANING TRENCH FOR AN AQUIFER RECHARGING SYSTEM

Edward H. Lacey, Trent, S. Dak. 57065

Continuation-in-part of Ser. No. 898,392, Apr. 19, 1978, Pat. No. 4,199,272. This application Sep. 12, 1979, Ser. No. 74,872
Int. Cl.³ E02B *11/00*
U.S. Cl. 405—176 20 Claims



1. Means for lining an aquifer recharging trench with membrane comprising carrying means, container means attached to said carrying means and adapted to extend downward into said trench, support means in said container means adapted to support at least one roll of said membrane on vertical axis, said container having sides and a rear wall means attached together to completely enclose said container from the side walls of said trench, said sides and rear wall means cooperating to form at least one slot through which said membrane can be unrolled from said roll and lie against a wall of said trench.

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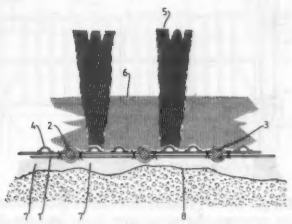
4,337,007

## UNDERWATER EROSION CONTROL STRUCTURE

Robert A. Smith, Knaresborough, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Mar. 25, 1980, Ser. No. 133,853
Claims priority, application United Kingdom, Apr. 24, 1979, 7914155; May 16, 1979, 7916954
Int. Cl.³ E02B *3/04*
U.S. Cl. 405—24 9 Claims



1. An erosion and scour control structure comprising a spaced array of filaments the improvement being that the spaced array consists of an array of longer fronds of filaments with a density less than that of water and an interspersed array of shorter filaments having a density greater than that of water, both arrays being attached to a base for laying on a sea or river bed.

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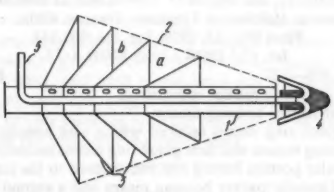
4,337,008

## APPARATUS FOR FISH PROTECTION

Valery A. Kulyabko, ulitsa 50 let Oktyabrya, 5, kv. 97, Volzhsky; Vera M. Sinyavskaya, prospekt Lenina, 15, kv. 126, Volgograd; Alexandr A. Sivkov, ulitsa Engelsa, 11, kv. 44, Volzhsky, and Evgeny N. Gavrilov, ulitsa Dzerzhinskogo, 7, kv. 54, Volgograd, all of U.S.S.R.

Filed Sep. 5, 1980, Ser. No. 184,303
Int. Cl.³ E01F *5/00*; E02B *3/00*
U.S. Cl. 405—127 2 Claims



1. An apparatus for protection of fish against entrapment, e.g., in a water intake arrangement, including: a perforated suction pipe; a water-permeable screen mounted on said pipe; partitions located between said pipe and screen, the length of contour of which resting on the screen decreases towards the perforated pipe inlet, the screen surface defined by two adjacent partitions being superior to that of the pipe between the same partitions; said partitions disposed on said pipe in a manner such that the hydraulic resistances therebetween will in-

crease in proportion to the distance from the partitions to the perforated pipe inlet.

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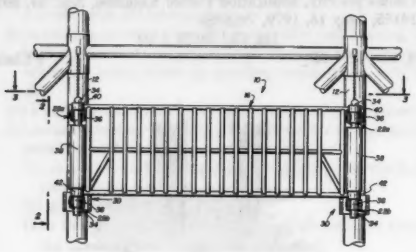
4,337,009

## MARINE LANDING STRUCTURE WITH OMNI DIRECTIONAL ENERGY ABSORBING CHARACTERISTICS

Jay W. Jackson, Corsicana, Tex., assignor to Regal International, Inc., Tex.

Filed Jul. 27, 1979, Ser. No. 61,266
Int. Cl.³ E02B 3/22
U.S. Cl. 405—212 10 Claims



1. An energy absorption system for connection to a marine structure to protect the structure from impact damage from vessels, such as boats, barges and the like, the system comprising:

a rigid landing frame for spanning a landing area, means on said frame for providing a contact surface for receiving impact loads from vessels colliding with said frame;

upper and lower vertically spaced shock cell means having one end coupled to said frame, means on the end opposite said one end for rigidly attaching said shock cell means to said structure; and

means operatively connecting said first end of each of said shock cell means to said landing frame to provide limited relative movement between said first ends of said shock cell means and said landing frame, said means permitting rotation only about an axis which extends vertically when said system is attached to a structure and preventing rotation about a horizontally extending axis whereby relative rotation can occur only about the vertical axis between said landing frame and the first ends of each of said shock cell means.

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4,337,010

## INFLATABLE GROUT SEAL

Bob L. Sullaway, and Harold O. Treece, both of Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.

Filed Dec. 13, 1979, Ser. No. 103,142
Int. Cl.³ E02B 17/02; E02D 5/52
U.S. Cl. 405—227 8 Claims

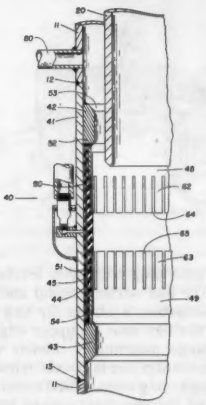
1. An inflatable packer comprising:

annular packer housing means;

first guide ring means secured within said annular packer housing means, said first guide ring means including a first annular portion having one end secured to the interior of said annular packer housing means and a second annular portion secured to the other end of the first annular portion, the second annular portion having an inner diameter larger than the inner diameter of the first annular portion, an outer diameter smaller than the outer diameter of the first annular portion, a substantially uniform cross-sectional thickness, and substantially uniform uninterrupted interior and exterior surfaces thereon;

second guide ring means secured within said annular packer housing means, said second guide ring means including a first annular portion having one end secured to the interior of said annular packer housing means and a second annular portion secured to the other end of the first annular portion, the second annular portion having an inner diameter larger than the inner diameter of the first annular portion, an outer diameter smaller than the outer diameter of the first annular portion, a substantially uniform cross-sectional thickness, and substantially uniform uninterrupted interior and exterior surfaces thereon;

annular inflatable packer member means having a first end portion, intermediate portion, a second end portion and annular reinforcement member means extending substantially throughout said annular inflatable packer member means terminating in the first and second end portions thereof, the first end portion secured from axial movement within said annular packer housing means by being bonded to the uniform uninterrupted exterior surface of



the second annular portion of said first guide ring means while the second end portion of said annular inflatable packer member means is secured from axial movement within said annular packer housing means by being bonded to the uniform uninterrupted exterior surface of the second annular portion of said second guide ring means;

first back-up shoe means adjacent the first end portion of said annular inflatable packer member means extending about the interior thereof, said first back-up shoe means being secured to said first guide ring means; and

second back-up shoe means adjacent the second end portion of said annular inflatable packer member means extending about the interior thereof, said second back-up shoe means being secured to said second guide ring means.

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4,337,011

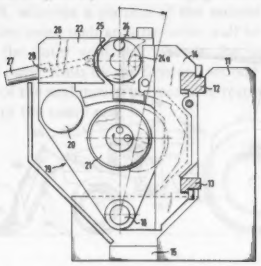
## CRANKSHAFT MILLING MACHINE

Karlheinz Schmid, Neckartenzlingen, Fed. Rep. of Germany, assignor to Gebrueder Heller, Maschinenfabrik GmbH, Nuertingen, Fed. Rep. of Germany

Filed Apr. 16, 1980, Ser. No. 140,686
Claims priority, application Fed. Rep. of Germany, Apr. 18, 1979, 2915662
Int. Cl.³ B23C 3/06
U.S. Cl. 409—199 10 Claims

1. A crankshaft milling machine, comprising machine frame means, at least one milling slide unit (14, 19) including slide means (14) and milling head means (19) on said slide means, said milling slide unit being operatively supported in said machine frame means for milling the stroke and bearing journals of a crankshaft, crankshaft support means defining a longitudinal axis and carried by said machine frame means for cooperation with said milling slide unit, feed drive means operatively

connected to said milling slide unit, copying means mounted to be operable in synchronism with the rotation of the crankshaft support means, said copying means being operatively connected to said feed drive means for controlling the latter, guide means (12, 13) held in said frame means, said milling slide unit being movable along said guide means (12, 13) in parallel to said longitudinal axis, said guide means for said milling slide unit defining a plane extending on one side of the crankshaft support means and substantially vertically in parallel to said



longitudinal axis, swivel axis means (18) operatively located in said milling slide unit below said longitudinal axis and in parallel to said longitudinal axis, said milling head means (19) being tiltably connected to said swivel axis means (18), said feed drive means being located on that side of the longitudinal axis facing away from the swivel axis means (18), said feed drive means extending between the milling slide unit and the milling head means and over said longitudinal axis, whereby a closed force flow is achieved and the machine frame is substantially relieved of the milling forces.

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**4,337,012**

## ANCHOR BOLT EXPANSION SHELL

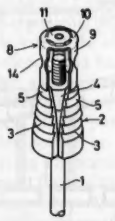
**Heinrich Sohnius, 6 Reitz St., Monument, Krugersdorp, Transvaal, South Africa**

**Filed Apr. 21, 1980, Ser. No. 142,867**

**Claims priority, application South Africa, Apr. 25, 1979, 79/1984**

**Int. Cl.³ F16B *13/08***

**U.S. Cl. 411—67** **6 Claims**



1. An anchor bolt expansion unit comprising a plurality of separate leaves having arcuate and serrated outer surfaces and substantially flat inner surfaces which taper inwardly in both width and thickness towards ends each secured to a finger of a bail of different material; the bail having a cap member connected about its periphery to the ends of the fingers remote from the leaves, the cap member including a central dimple portion extending axially in a direction toward the leaves and a peripherial line of weakness formed in the cap about the dimple portion and being positioned on a diameter larger than that of a bolt with which the unit is to be used and a conical nut having flat surfaces provided thereon adapted to engage the inner surfaces of the leaves and being threaded on the bolt and wherein the dimple portion is shaped and dimensioned so as to engage one end of the rod solely within the outer periphery of the rod.

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**4,337,013**

## PLANT WITH MOBILE PLATFORMS FOR PARKING MOTOR VEHICLES OR THE LIKE

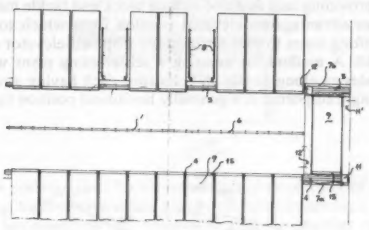
**Giovanni Buttironi, Bergamo, Italy, assignor to AU.RO S.r.l, Bergamo, Italy**

**Filed Jun. 11, 1979, Ser. No. 47,105**

**Claims priority, application Italy, Jun. 15, 1978, 24599 A/78**

**Int. Cl.³ E04H *6/06***

**U.S. Cl. 414—240** **14 Claims**



1. Plant for storing units, particularly motor vehicles, onto mobile platforms over a storing or parking area having at least one long parking stretch and a parallel service corridor along a side of said parking stretch, comprising:

a service track running along said service corridor,

at least one motored travelling wagon adapted for movement along said service track,

a plurality of storing or parking places in said parking stretch, each place being provided with a stationing track with an axis transverse to the axis of the service track,

a plurality of mobile platforms slidable both on said stationing tracks and on said travelling wagon, each of said platforms having an inverted U-shaped channel section extending in a direction parallel to the axis of the service track, the U-shaped channel sections are all substantially aligned on a common axis when the platforms are arranged on the stationing tracks,

transfer means, associated with said travelling wagon, for transferring said mobile platforms from a respective stationing track onto the travelling wagon, or vice versa from the wagon towards the respective stationing track,

said transfer means comprising at least one carriage movable along the travelling wagon in a direction parallel to said stationing tracks, and

hook means fixed to said carriage for substantially continuously engaging at least one of the inverted U-shaped channel sections during movement of the travelling wagon along the service track, said hook means being adapted to move one platform onto the wagon from the respective stationing track, or vice versa, to push the platform off of the wagon towards the respective stationing track.

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**4,337,014**

## METHOD AND APPARATUS FOR ERECTING A PORTABLE SILO AND ELEVATOR

**Robert E. Farnham, Naperville, Ill., assignor to Barber-Greene Company, Aurora, Ill.**

**Filed Nov. 28, 1980, Ser. No. 211,367**

**Int. Cl.³ E04H *7/00***

**U.S. Cl. 414—332** **11 Claims**

1. An improved self-erecting plant including an elongate silo and elevator, each having means for being transported in a generally horizontal position to an erection site and each being

functional in a generally vertical position wherein each consists of a top and bottom portion, the improvement comprising:

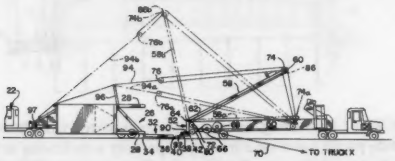
(a) a base hingedly connected to the bottom portion of said silo and the bottom portion of said elevator;

(b) a vertically disposed mast having an upper and a lower end, said lower end being mounted in juxtaposition with said base;

(c) a first block and tackle means, coupled between the top portion of said silo and the upper end of said mast, for pivotally raising said silo about said base from a horizontal to vertical position;

(d) a second block and tackle means, coupled between the top portion of said elevator and the upper end of said mast, for pivotally raising said elevator about said base from a horizontal to a vertical position, the upper end of said mast providing said first and second block and tackle means with an advantageous elevated position from which to apply a lifting force to said horizontally disposed elevator and silo.

**10.** A method for erecting a self-erecting plant which includes an elongate silo and elevator, each having a means for being transported in a generally horizontal position to an erec-




tion site and each consisting of a top and bottom portion, said plant further including a base, a longitudinal mast having an upper end and a lower end hingedly mounted adjacent said base, a first and second block and tackle means each coupled to the upper end of said mast and coupled respectively to the top portion of said silo and the top portion of said elevator, said method comprising the steps of:

(a) aligning said horizontally disposed elevator and silo in opposing bottom-to-bottom relationship,

(b) connecting the bottom portion of said silo and the bottom portion of said elevator to said base for pivotal movement about the latter,

(c) hingedly raising said mast above said base to a substantially vertical position,

(d) applying a lifting force to the top portion of said horizontally disposed silo by said first block and tackle means so as to cause said silo to pivot about said base to assume a vertical position,

(e) applying a lifting force to the top portion of said elevator by said second block and tackle means causing said elevator to pivot about said base to assume a vertical position, thereby erecting said plant.

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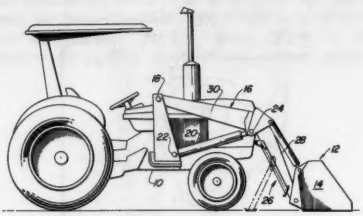
**4,337,015**

## PARKING STAND MEANS FOR TRACTOR-DISMOUNTED IMPLEMENT

**Henry Friesen, Niagara Falls, and Clarence R. Trott, Welland, both of Canada, assignors to Deere & Company, Moline, Ill.**

**Filed Jun. 23, 1980, Ser. No. 161,840**
**Int. Cl.³ E02F *3/14***
**U.S. Cl. 414—686** **4 Claims**

**1.** For a tractor-dismounted implement having a part adapted to rest on the ground and at least one frame element connected to the part and having an uphill portion extending rearwardly away from the part and an elevated portion above the ground: a parking stand for supporting the elevated portion of the part above the ground having elongated uphill slide means carried by the uphill portion of the element adjacent to the elevated portion of the element and having a lower stop portion, a strut-like support having upper and lower ends, a combination guide and pivot member connecting the upper end of the support to the slide means for uphill movement as well as for swinging of the support forwardly toward and adjacent to the uphill portion of the element to occupy a retracted position in which the lower end of the support is clear of the ground and, selectively, for downhill movement in the slide means until said member engages the lower stop portion and becomes pivoted thereat for rearward swinging of the support away from the uphill portion of the element to occupy a parking position in which the lower end of the support engages the ground in rearwardly spaced relationship to the aforesaid part, the improvement comprising an extension rigid



on an upper part of the support and providing an arm extending away from the combination guide and pivot member and arranged to lie closely alongside the uphill portion of the frame element in the parking position of the support, and a lock element engageable between the arm and the uphill portion in said parking position to prevent the support from both swinging and sliding, said lock element being disengageable from the arm and support and engageable the support and the uphill portion in the transport position of the support to retain the support against both sliding and swinging.

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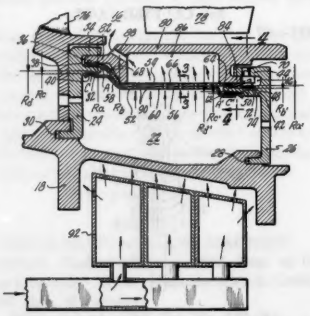
**4,337,016**

## DUAL WALL SEAL MEANS

**Gary F. Chaplin, Vernon, Conn., assignor to United Technologies Corporation, Hartford, Conn.**

**Filed Dec. 13, 1979, Ser. No. 103,007**
**Int. Cl.³ F01D *5/18***
**U.S. Cl. 415—116** **7 Claims**



**1.** For a gas turbine engine having an annular flowpath for working medium gases extending axially through the engine and an annular flowpath for cooling air spaced radially outwardly of the working medium flowpath, a structure for confining the cooling air to the cooling air flowpath which comprises:

an outer case circumscribing the cooling air flowpath;

a first element extending inwardly from the outer case;

a second element extending inwardly from the outer case and spaced axially from the first element; and,

a means disposed between the cooling air flowpath and the working medium flowpath for preventing the leakage of

cooling air between said first element and said second element, the means including

an inner wall comprised of a plurality of circumferentially adjacent segments which are engaged by the first element and the second element to form a seal at the inner wall,

an outer wall comprised of a plurality of circumferentially adjacent segments which are engaged by the first element and the second element to form a seal at the outer wall;

wherein a portion of the first element extends between the inner wall and the outer wall to engage the inner wall and the outer wall, wherein a portion of the second element extends between the inner wall and the outer wall to engage the inner wall and the outer wall and wherein the engagement of the inner and outer walls by the first and second elements sets the diameter of the seal means in operative response to changes in diameter of the outer case.

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**4,337,017**

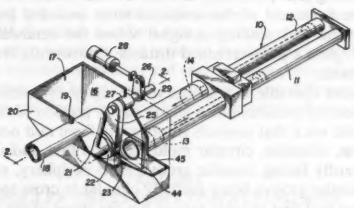
## HYDRAULIC SLEEVE VALVE AND SEAL ARRANGEMENT FOR PISTON PUMP

**William R. Evenson, 11618 Sagehollow, Houston, Tex. 77089**

**Continuation-in-part of Ser. No. 79,305, Sep. 26, 1979, abandoned. This application Dec. 4, 1980, Ser. No. 213,022**

**Int. Cl.³ F04B *7/00***

**U.S. Cl. 417—516** **9 Claims**



1. In a pumping apparatus for concrete or the like including a hopper, a pair of alternating filling and pumping cylinder units connected in a wall of the hopper, a concrete transmission conduit connected in said hopper and having an elbow portion in the hopper, a crank means coupled with the elbow portion to swing it back and forth between positions of registration with the bores of said piston units, the improvement comprising a housing portion on the crank means having a stepped bore and having a hydraulic fluid port leading into the stepped bore, a stepped floating sleeve element engaged movably within the stepped bore and having an annular radial piston face within the larger portion of the stepped bore and being in communication with said port, a wear ring having interengaged relationship with one end of the floating sleeve element exteriorly of said housing portion, an opposing relatively stationary wear plate means fixed to said hopper and slidably abutting the wear ring and having opening means in registration with the bores of said cylinder units, there being an annular gap between the other end of the floating sleeve element and an end face of said elbow and receiving pressurized concrete which supplements the fluid pressure force of the hydraulic fluid on said piston face urging said floating sleeve element against the wear ring, and ring seals between the stepped surfaces of said floating sleeve element and said stepped bore on opposite sides of said port.

**4,337,018**

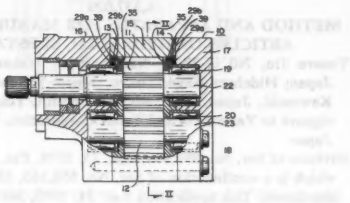
## ROTARY IMPELLER PUMP OR MOTOR WITH COUNTERBALANCING CHAMBER IN THRUST PLATE BEARING COUNTERBORE

**Carl M. Singer, New Castle, Pa.; Mateiu J. Oana, and John D. Turko, both of Youngstown, Ohio, assignors to Commercial Shearing, Inc., Youngstown, Ohio**

**Filed Jan. 29, 1980, Ser. No. 116,636**

**Int. Cl.³ F03C *2/08*; F04C *2/18, 15/00***

**U.S. Cl. 418—132** **10 Claims**



1. A pressure plate for corresponding ends of a pair of cooperating impellers in a rotary pump or motor comprising a metal body having a first face adapted to abut the impeller ends, a pair of openings to receive impeller shafts and a second face generally parallel to said first face, a plurality of chambers in said first face defined by radial lands on the first face bearing against the impellers to restrict flow across said first face, said lands being of such size as to provide a one tooth seal with the impellers between adjacent chambers of said plurality of chambers, a counterbore in each opening of said pair of openings at said second face, an annular seal in each counterbore intermediate the ends thereof and forming two separate chambers therein when bearing means are assembled in each counterbore and passage means communicating between the periphery of the thrust plate at opposite ends and one of said chambers in each counterbore.

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**4,337,019**

## MACHINE FOR MANUFACTURING DISKS ON A ROD

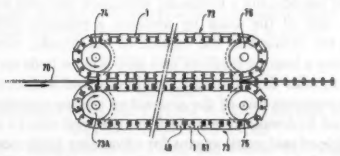
**Georges N. Comte, Lyons; Andre Appriou, Tassin la Demi-Lune, and Jean Couturier, Craponne, all of France, assignors to Les Cables de Lyon, Lyons, France**

**Filed Mar. 13, 1981, Ser. No. 243,667**

**Claims priority, application France, Mar. 14, 1980, 80 05769**

**Int. Cl.³ B29C *6/00***

**U.S. Cl. 425—116** **5 Claims**



1. In a machine for manufacturing disks on a very long rod, said machine including two conveyor-driven chains of moulding units that press against one another and receive said rod therebetween in an area provided within abutting mating moulding units of said two chains with at least one orifice for injecting a mouldable substance into a cavity formed between a pair of mating units, one from each chain, the units then parting to release a disk-shaped part moulded onto said very long rod, the improvement wherein at least one of the chains of moulding units has at least one so-called "hermaphrodite" moulding unit with leading tabs and trailing tabs for fixing to

its adjacent units, the gap between its leading tabs being different from the gap between its trailing tabs, and these two gaps being such that they allow said "hermaphrodite" unit to be inserted between a "female" unit with a wide gap between its tabs and a "male" unit with a narrow gap between its tabs or between two other, like, hermaphrodite units.

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4,337,020

## METHOD AND APPARATUS FOR MANUFACTURING ARTICLES OF HYDRAULIC SUBSTANCES

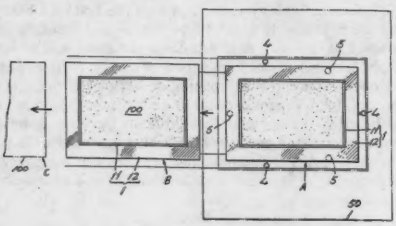
Yasuro Ito, N0. 4-38-16 Numabukuro, Nakano-ku,, Tokyo, Japan; Hideharu Kaga, Tokyo, Japan; Yasuhiro Yamamoto, Kawasaki, Japan, and Tadayuki Sumita, Tokyo, Japan, assignors to Yasuro Ito and Taisei Corporation, both of Tokyo, Japan

Division of Ser. No. 899,849, Apr. 25, 1978, Pat. No. 4,234,534, which is a continuation of Ser. No. 558,165, Mar. 13, 1975, abandoned. This application Jan. 31, 1980, Ser. No. 117,357

Claims priority, application Japan, Mar. 13, 1974, 49-28025; Feb. 14, 1975, 50-19736[U]; Feb. 14, 1975, 50-19737[U]; Feb. 17, 1975, 50-18709; Feb. 25, 1975, 50-23035

Int. Cl.[3] B28B *1/24*

U.S. Cl. 425—129 R 38 Claims



1. An apparatus for continuously and sequentially manufacturing products of prepacked concrete comprising a plurality of moulds each of which is prepacked with a coarse aggregate vertically stacked with a plurality of hollow beds alternately disposed therebetween, said stack having a feed side and a discharge side, said moulds being releasably interconnected for resisting pressure changes and wherein sealing members are interposed between said beds and the moulds throughout the stack for airtightly closing said moulds, said apparatus further including means for reducing the pressure in said moulds, means for introducing a hydraulic substance into said mould at the feed side of the stack by utilizing a pressure difference between the inside and the outside of the mould, means for introducing a heating medium into said hollow beds surrounding said moulds for gradually, uniformly and indirectly heat curing a concrete mix of the prepacked coarse aggregate and the poured hydraulic substance from the feed side to the discharge side of said stack, means for advancing each mould and adjacent beds by one step at a time through said stack from the feed side to the discharge side thereof, so that each mould occupies the position of the preceding mould as it advances through said stack, the curing of said hydraulic cement taking place at different stages throughout said stack of said moulds, means for removing one mould containing said concrete product which has been sufficiently cured from the discharge side of said stack of said plurality of moulds and means for preparing a fresh mould in which a coarse aggregate is prepacked and bed at the feed side of the stack where said mould is recharged with said hydraulic substance, thus providing an apparatus for continuously manufacturing said concrete products.

4,337,021

## APPARATUS FOR MOLDING FIXED-DIMENSIONAL SPHERICAL BODIES FROM A SEMISOLID STICK

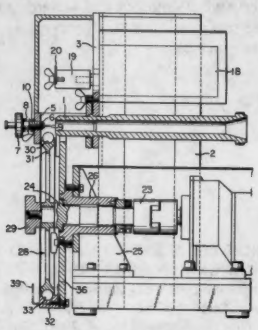
Yasuo Omi, Yamato; Takanori Wada, Machida; Hitoshi Sano, Sayama; Shigekatsu Sato, Hidaka; Kazuo Ido, Hino; Kozo Taneda, Kodaira, and Junichi Naka, Tokyo, all of Japan, assignors to Snow Brand Milk Products Co., Ltd., Sapporo, Japan

Filed Apr. 9, 1980, Ser. No. 138,813

Claims priority, application Japan, Jun. 26, 1979, 54-87305[U]; Jun. 26, 1979, 54-87306[U]

Int. Cl.[3] B28B *17/00*

U.S. Cl. 425—142 6 Claims



1. An apparatus for molding spherical bodies, comprising:

an extruder having a nozzle for extruding a semisolid stick of extrudable material;

a sensing unit positioned in front of said nozzle for sensing the front end of the semisolid stick extruded from said nozzle and sending a signal when the semisolid stick projects a predetermined distance frontwardly from said nozzle;

a cutter operable in response to the signal for cutting off a piece of predetermined length of the portion of the semisolid stick that projects frontwardly from said nozzle;

a first, rotatable, circular mold having a first, radially outwardly facing, annular groove in its periphery, said first annular groove being partially circular in cross section so that said first annular groove has the shape of the radially inner portion of a torus, said first, rotatable, circular mold being disposed so that the pieces cut off from the semisolid stick are received in said first annular groove and the pieces move with said first annular groove as said first, rotatable, circular mold rotates;

a second, stationary, substantially semi-circular mold located outside of and adjacent to said first, rotatable, circular mold and extending circumferentially thereof and defining therewith a substantially semi-circular shaping zone, said semicircular shaping zone having an inlet at the circumferential end thereof located close to said nozzle and an outlet at the opposite circumferential end thereof, said second, stationary mold having a second, radially inwardly facing, substantially semi-circular groove, said second groove being substantially partially circular in cross section so that said second groove has the shape of the radially outer portion of a substantially semi-circular segment of the torus, said first and second grooves mating in said shaping zone to define an elongated mold cavity having the shape of a substantially semi-circular segment of the torus, the torus having a substantially circular cross section so that the pieces are formed into spherical bodies as they move through said shaping zone as said first, rotatable, circular mold rotates relative to said second, stationary mold;

and means for discharging said spherical bodies from the outlet of said shaping zone.

4,337,022

## ADAPTABLE INJECTION MOLDING INSTALLATION MOUNTING ARRANGEMENT

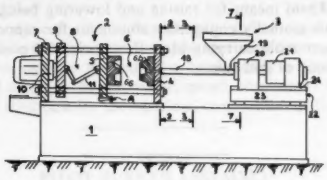
**Jean Laurent, Oyonnax; Bernard Monnet, Bellignat, and Philippe Pertuis, Oyonnax, all of France, assignors to Pont-a-Mousson S.A., Nancy, France**

**Filed Oct. 3, 1980, Ser. No. 193,693**

**Claims priority, application France, Oct. 9, 1979, 79 25524**

**Int. Cl.³ B29F *1/00*; B29C *1/16***

**U.S. Cl. 425—192 R** **9 Claims**



1. An injection molding installation for molding articles of plastics, elastomers or like materials, comprising: a single rigid box-like mounting base; a pressure injection apparatus mounted on said base through an interchangeable support rail and means for adjusting the height of said support rail and said pressure injection apparatus relative to said base; a molding press having fixed plates and a moveable plate; first and second adjustable adaptor wedge pairs each having a lower wedge member disposed on said base; first and second mounting members for mounting said moveable plate to said first and second adjustable adaptor wedges, wherein said adaptor wedges are adjustable to adjust the height of said moveable plate relative to said base, upper members of said wedge pairs being wider than the corresponding lower wedge members and being attached by threaded members to said moveable plate, said threaded members being laterally spaced from the lower wedge members, and wherein the heights of both said pressure injection apparatus and said molding press relative to one another can be adjusted to accommodate different sized moveable and fixed plates and hence different types of molding presses.

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4,337,023

## ROLLER PRESS FOR COMPACTING AND BRIQUETTING OF BULK MATERIAL

**Heinz Köppern, Hattingen; Hans-Georg Bergendahl, Bochum; Hartmut Rieschel, and Friedhelm Koch, both of Hattingen, all of Fed. Rep. of Germany, assignors to Maschinenfabrik Köppern GmbH & Co. KG, Hattingen, Fed. Rep. of Germany**

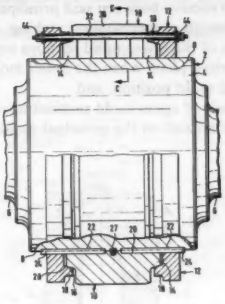
**Filed May 8, 1981, Ser. No. 261,700**

**Claims priority, application Fed. Rep. of Germany, Oct. 5, 1980, 3017962**

**Int. Cl.³ B29C *3/02, 15/00***

**U.S. Cl. 425—237** **5 Claims**

1. A roller press for compacting and briquetting bulk material having rollers, each comprising a core having a cylindrical surface, a plurality of segments resting on the cylindrical surface of the roller core adjacent one another along their longitudinal edges parallel to the axis and which, in each case, are provided at their ends with shoulder faces which extend at an acute angle of less than 45° to the axis of the roller; adjusting springs extending parallel to the axis of the roller by means of which the segments are fixed on the roller core in the circumferential direction; holding elements which overlap said shoulder faces, and clamping bolts for the holding elements which are passed between the longitudinal edges of the segments and which are located in recesses in said longitudinal edges, said holding elements being a pair of continuous clamping rings which are provided with projections having frusto-conical shoulder faces having an arrangement and a circumferential width such that the shoulder faces on the segments are abutted in their central regions by the shoulder faces on the clamping rings, each clamping ring provided at its inner circumference with adjusting spring grooves parallel to the axis of the clamping ring and the adjusting springs for the segments projecting,



parallel to the axis of the roller, beyond the end of the segment to such an extent that they engage in the adjusting spring grooves in the clamping ring.

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4,337,024

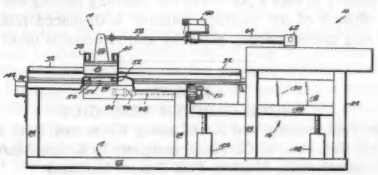
## SEAM ROLLER

**Edward W. Turner, Deerfield, and Peter J. Blake, Bondsville, both of Mass., assignors to Hardigg Industries, Inc., Deerfield, Mass.**

**Filed Mar. 20, 1981, Ser. No. 245,978**

**Int. Cl.³ B29C *15/00***

**U.S. Cl. 425—363** **7 Claims**



1. Apparatus for relieving tensile stress along welded seams in plastic containers comprised of means for holding the container so that at least one seam therein is at a predetermined position, movable roller means including at least two rollers respectively engaging the inner and outer sides of the seam and for applying rolling pressure thereto, and drive means for moving said at least two rollers along a predetermined portion of the seam and for establishing the rolling pressure.

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4,337,025

## APPARATUS FOR MOLDING A CONTAINER WITH OFFSET PARTING LINE

**Louis T. Pagels, Hanover Park, and Dieter H. Nagel, Des Plaines, both of Ill., assignors to Automatic Liquid Packaging, Inc., Arlington Heights, Ill.**

**Filed Aug. 25, 1980, Ser. No. 180,961**

**Int. Cl.³ B29C *17/07***

**U.S. Cl. 425—392** **4 Claims**

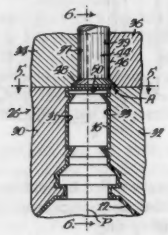
1. A mold assembly for molding a container from an extruded length of thermoplastic tubing and thereafter sealing the molded container, which assembly comprises:

a pair of movable, opposed lower mold sections each having a principal mold face defining a cavity adapted to shape a body portion of the container and a pair of movable opposed upper mold sections each having a principal mold

face and adapted to shape a unitary flat, pierceable closure for the container;

said movable mold sections being positionable between an open mold position and a closed mold position and being adapted to receive between said principal mold faces said extruded length of thermoplastic tubing, and the principal mold faces of the lower mold sections together defining a central parting plane when the lower mold sections are in said closed mold position; and

one of said pair of upper mold sections having a mold insert removably affixed on the principal mold face thereof for



shaping at least a portion of said pierceable closure, said mold insert being a generally cylindrical member having a substantially flat base at one end adapted to shape a major portion of the exterior surface of said pierceable closure, and the other of said pair of upper mold sections having a recess complementary to said mold insert and adapted to mate with said mold insert when the upper mold sections are in said closed mold position;

whereby at least a portion of the resulting parting line on the closure of the molded container is displaced relative to said central parting plane by said removable mold insert.

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**4,337,026**

## MOLD-CARRIER ASSEMBLY

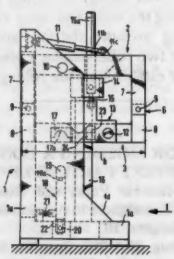
**Peter Taubenmann, and Karl-Ludwig Korzeczek, both of Munich, Fed. Rep. of Germany, assignors to Krauss-Maffei Aktiengesellschaft, Munich, Fed. Rep. of Germany**

**Filed Oct. 1, 1980, Ser. No. 192,824**

**Claims priority, application Fed. Rep. of Germany, Oct. 3, 1979, 2940114**

**Int. Cl.³ B29C *3/00***

**U.S. Cl. 425—454** **10 Claims**



1. A mold-handling device for a pair of mold parts defining a molding tool, said device comprising:

a support;

an upper mold-carrying plate adapted to receive one of said parts and pivotally mounted on said support;

a lower mold-carrying plate engageable with said upper mold-carrying plate in a closed position of said plates;

locking means on said plates for directly fixing said plates together in said closed position;

means for raising and lowering said lower mold-carrying plate on said support, said lower mold-carrying plate being pivotally connected to the latter means at a respective pivot axis; and

at least one upwardly extending stop bar on said support engageable with said lower mold-carrying plate upon the lowering of said axis, thereby tilting said lower mold-carrying plate about said axis, said lower mold-carrying plate and said means for raising and lowering being provided with mutually engageable abutments for supporting said lower mold-carrying plate in a horizontal position upon raising of said axis.

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**4,337,027**

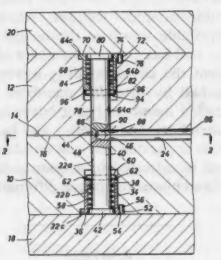
## INJECTION MOLD VALVE

**Royel F. Montieth, #958 5440 N. Brasewood, Houston, Tex. 77096**

**Filed Aug. 6, 1980, Ser. No. 175,914**

**Int. Cl.³ B29F *1/05***

**U.S. Cl. 425—562** **15 Claims**



1. An injection mold apparatus comprising:

a mold body comprising first and second integral body members having respective opposed first and second interface surfaces, said body members being releasably mounted in abutment with each other along said interface surfaces;

said first body member having

a first bore opening through said first interface surface, and

at least two concavities in and opening through said first interface surface generally radiating from said first bore,

and a first valve element mounted in said first bore having an end face generally contiguous said first interface surface and facing in the same direction therewith, said first valve element having first recess means in said end face opening radially of said first valve element, as well as axially through said end face, said first valve element being selectively rotatable between a first position in which said first recess means is aligned with both of said concavities to provide communication therebetween via said first recess means, and a second position in which said first recess means is displaced from alignment with at least one of said concavities to block said one concavity from communication with the other of said said concavities via said first recess means.

4,337,028

## CATALYTIC MONOLITH, METHOD OF ITS FORMULATION AND COMBUSTION PROCESS USING THE CATALYTIC MONOLITH

Meredith J. Angwin, Palo Alto, Calif., and William C. Pfefferle, Middletown, N.J., assignors to The United States of America as represented by the United States Environmental Protection Agency, Washington, D.C.

Filed May 27, 1980, Ser. No. 153,057
Int. Cl.³ B01J *21/04, 23/86, 35/04;* F23D *3/40*
U.S. Cl. 431—7 29 Claims

1. A catalytically active structurally sound ceramic in a monolithic form having gas flow passages with heterogeneous combustion surfaces formed of a catalytically active mixed base metal oxide of the perovskite, spinel, corundum or ilmenite crystal structure for the sustained combustion of fuels.

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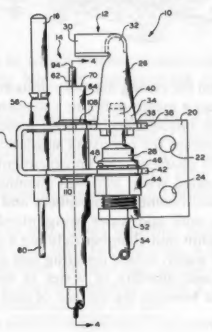
4,337,029

## PILOT BURNER ASSEMBLY

Jerry W. McElroy, St. Louis, and Donald C. Urban, Florissant, both of Mo., assignors to Emerson Electric Co., St. Louis, Mo.

Filed Mar. 28, 1980, Ser. No. 135,166
Int. Cl.³ F23N *5/10;* F23Q *3/00*
U.S. Cl. 431—264 4 Claims



1. In a pilot burner assembly,

U-shaped mounting bracket having an upper leg and a lower leg, each said leg having first, second, and third openings therein;

a pilot burner comprising a guard rigidly attached to said upper leg at said first opening therein, and an orifice screw extending through said first opening in said lower leg of said bracket,

said orifice screw being telescopically received by said guard and removably attached to said lower leg;

a spark electrode assembly including a straight electrode co-axial with an insulating sleeve, wherein a tip of said electrode and a portion of said guard define a spark gap, and wherein said electrode tip extends a distance beyond an edge of said sleeve,

said spark electrode assembly further including an electrically conductive tube telescopically receiving and rigidly connected to a portion of said electrode within said sleeve so as to adjustably establish said distance that said electrode tip extends beyond an edge of said sleeve, and means cooperative with said electrode, tube, and sleeve for rigidly maintaining said distance;

means for adjusting said spark gap comprising means for frictionally attaching said sleeve to said second openings in said upper and lower legs of said bracket; and

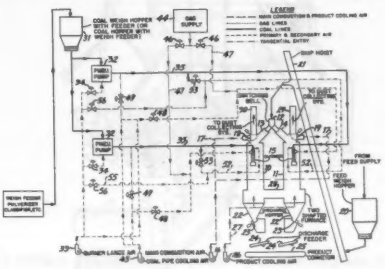
flame responsive means extending through said third openings in said upper and lower legs of said bracket and securely attached to at least one of said third openings and disposed so as to be impinged by a flame from said pilot burner.

4,337,030

## SOLID FUEL FIRED KILN

Edward Gootzait, Lewisburg, and Donald L. Fisher, Milton, both of Pa., assignors to Kennedy Van Saun Corporation, Danville, Pa.

Filed Mar. 3, 1980, Ser. No. 126,310
Int. Cl.³ F27B *15/00*
U.S. Cl. 432—14 10 Claims



1. A fuel burner comprising means defining a pre-combustion chamber having a lower region which is in communication with the combustion chamber of the kiln, an outer conduit communicating at its lower end with the upper region of the pre-combustion chamber and extending upwardly within the kiln, an inner conduit within the outer conduit and having its lower discharge end within the outer conduit and spaced above the upper region of the pre-combustion chamber, pneumatic feed means for supplying a pulverized solid fuel and air mixture to the inlet end of said inner conduit and for discharging the mixture into the pre-combustion chamber, the air in the mixture supporting at least partial combustion of the solid fuel particles within the pre-combustion chamber, means for supplying air to the outer conduit for cooling the conduits and supporting combustion within the pre-combustion chamber, means for supplying an air supply to the combustion chamber of the kiln proper to support combustion outside the pre-combustion chamber, and an apertured depending wall forming part of the pre-combustion chamber for discharging at least part of the stream from the inner conduit through the apertures, thereby forming a lower pressure toroidal zone in the upper region of the pre-combustion chamber around the outer periphery thereof for inducing flow into the pre-combustion chamber.

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4,337,031

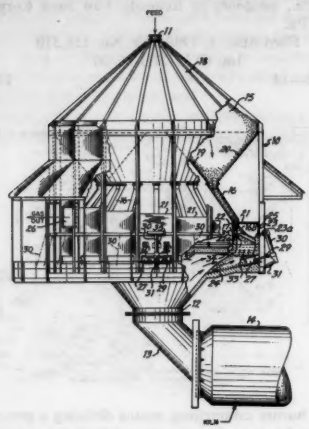
## PREHEATING APPARATUS

Kenneth L. Gardner, Riverside; William E. Zimmer, and Samuel A. Miller, both of Danville, all of Pa., assignors to Kennedy Van Saun Corporation, Danville, Pa.

Filed Feb. 2, 1981, Ser. No. 230,730
Int. Cl.³ F27D *1/08;* F27B *7/02;* F26B *17/12*
U.S. Cl. 432—98 6 Claims

1. A preheating apparatus for particulate material comprising an annular flow passage for the particulate material having a lower discharge, an annular sloped surface forming the lower end of the annular flow passage across which the material moves toward said lower discharge, means for moving the material across the sloped surface toward said discharge, means for introducing hot kiln gases into the lower region of said annular flow passage above the sloped surface for flow in countercurrent heat exchange relationship with the particulate material, a plurality of hot kiln gas ducts extending radially across said annular flow passage and communicating at their inner ends with the hot kiln gases above the material moving across the sloped floor and extending substantially across the annular flow passage above the means for moving the material across the sloped surface and means for discharging the hot kiln gases from the lower regions of the radially extending

ducts substantially throughout the radial lengths thereof to cause the hot kiln gases to flow outwardly around the radially



extending ducts and then in countercurrent direction to the particulate material.

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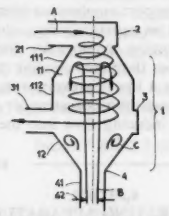
**4,337,032**

## DEVICE FOR MIXING GASEOUS FLUIDS BY TURBULENCE

**Alain Duplouy, Bievres, and Bernard Le Bras, Montelimar, both of France, assignors to Lafarge Coppee, Paris, France**

**Filed Jan. 28, 1981, Ser. No. 229,252**
**Claims priority, application France, Jan. 28, 1980, 80 01794**
**Int. Cl.³ F27B *7/02, 15/00;* F23C *5/32***
**U.S. Cl. 432—106** **16 Claims**



1. A device for mixing by turbulence gaseous fluids and solid particles in suspension, comprising

(a) a mixing chamber (1) bounded laterally by a wall of revolution about a vertical axis and into which emerge two flows of gaseous fluids at least one of which contains said particles in suspension;

(b) a first inlet (2) located at the upper end of said chamber (1) for introducing a first flow (A) forming a vortex in said chamber;

(c) an outlet volute (3) through which said first flow is exhausted;

(d) a second inlet (4) located at the lower end and on the axis of said chamber (1) for introducing a second axial flow (B), the latter forming a jet which is sucked inside said vortex in order to mix there with said first flow, the whole being exhausted through said outlet volute (3);

(e) said outlet volute (3) being located in the central portion of said chamber (1);

(f) said chamber comprising an upper portion (11) for the formation of said vortex and said outlet volute, and a lower portion (12) which widens upwards between said second inlet (4)

and said outlet volute (3), for the recovery and recycling into said axial flow (b) of solid particles which escape from said vortex.

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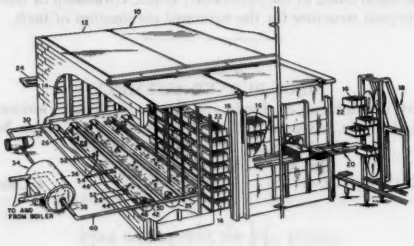
**4,337,033**

## APPARATUS FOR CURING MASONRY UNITS

**Bob R. Drain, 3660 N. 3rd St., Phoenix, Ariz. 85012**

**Division of Ser. No. 888,630, Mar. 21, 1978, Pat. No. 4,244,904. This application Jan. 2, 1981, Ser. No. 222,055**
**Int. Cl.³ F27B *15/00, 5/16***
**U.S. Cl. 432—197** **5 Claims**



1. In a system for curing masonry units employing heated air including housing means defining a substantially closed chamber, means for introducing uncured masonry units into said chamber and means for removing substantially cured masonry units from said chamber, the improvement comprising means introducing heated water into said chamber, means collecting a portion of said chamber atmosphere and aspirating said collected portion with said water being introduced to said chamber, means within said chamber defining a vessel for a quantity of said heated water, means injecting said air and heated water mixture into said quantity of water in said vessel at spaced apart locations beneath the surface of said quantity of water.

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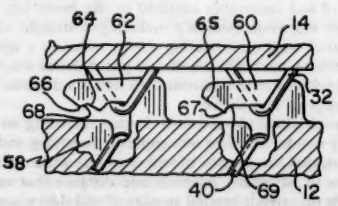
**4,337,034**

## PROTECTIVE REFRACTORY MEMBER LOCKING DEVICE

**John W. Morgan, II, Pittsburgh, and Hans E. Leumann, Washington, both of Pa., assignors to Bloom Engineering Company, Inc., Pittsburgh, Pa.**

**Filed Feb. 2, 1981, Ser. No. 231,228**
**Int. Cl.³ F27D *3/02***
**U.S. Cl. 432—234** **9 Claims**



1. A protective refractory elongated hollow member for protecting pipe and the like in high temperature metallurgical furnaces comprising an arcuately shaped male part and an arcuately shaped female part interconnected at their respective longitudinal edges to form said member, said male part including a clip partially embedded within the part and including at least a first and second spaced apart hook extending outward from the longitudinal edges, said female part having at least one hook receiving member partially embedded within the

part and including loops extending outward from the longitudinal edges for receiving the hooks, at least one of said hooks including locking means for engaging the loop and preventing the disengagement of the parts.

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4,337,035

## FIRING KILN; WITH EMPHASIS ON ROLLERS FOR A FIRING KILN

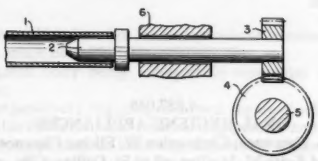
Rolfo Barchi, Castellon, Spain, assignor to Karl August Heimsoth Industrie, Hildesheim, Fed. Rep. of Germany

Filed Nov. 17, 1980, Ser. No. 207,733

Claims priority, application Fed. Rep. of Germany, Nov. 26, 1979, 2947540

Int. Cl.³ F27D 3/00

U.S. Cl. 432—246 4 Claims




1. In a firing kiln in which ceramic components are fired in a firing zone of the kiln, the improvement comprising the combination of:

(a) a roller conveyor with a large number of fixed but rotating rollers with a small diameter and at short intervals, for moving said ceramic components into the kiln and out of it, and particularly through the firing zone of the kiln;

(b) drive means engaging said rollers for driving each of said rollers; and

(c) wherein each of said rollers is further defined as:

(1) constructed in at least two sections, a middle section and an end section, wherein said middle section is constructed of a ceramic member with a tubular cover made of austenitic steel or the like;

(2) each of said sections is adapted to be connected by plug connections;

(3) each of said end sections has a means for engaging said drive means;

(4) each of said end sections is provided with a cross pin and a ball-and-spring device; and,

(5) each of said middle sections is constructed with longitudinal slots distributed around the circumference to receive said cross pin and with borings distributed around the circumference for reception of the ball.

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4,337,036

## ORTHOPEDIC PRESSURE APPLIANCE AND METHOD FOR CONTROLLING DEVELOPMENT OF THE MAXILLARY BONE

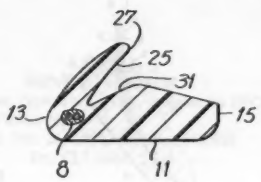
Carl S. Hoffman, 390 Crestwood Dr., Cheshire, Conn. 06410

Continuation of Ser. No. 71,174, Aug. 31, 1979, abandoned. This application Aug. 26, 1980, Ser. No. 181,632

Int. Cl.³ A61C 7/00

U.S. Cl. 433—5 6 Claims

1. In an orthopedic pressure appliance comprising a body with a form approximating a dental arch with an anterior portion and two symmetric posterior portions extending therefrom and having a lingual surface, a labial-buccal surface, two pharyngeal surfaces bridging the adjacent respective posterior ends of said labial-buccal and lingual surfaces, an upper surface, a lower surface, and a pair of symmetrical wire prongs extending laterally in opposite directions and posteriorly from the labial edge of the anterior portion of said body, the improvement which comprises a first ridge extending upwardly from said upper surface adjacent said labial-buccal surface and defining a first flange surface upwardly posteriorly sloping at the anterior region extending laterally in opposite directions and posteriorly from the labial edge of the anterior portion of said body, the improvement which comprises a first ridge extending upwardly from said upper surface adjacent said labial-buccal surface and defining a first flange surface upwardly posteriorly sloping at the anterior region thereof and having there at an upper edge adapted to engage the gingival third or at least some of the maxillary anterior teeth, a second ridge and a third ridge each extending upwardly from said




upper surface adjacent the respective posterior regions of said lingual surface and defining respective second and third flange surfaces adapted to engage the lingual surfaces of at least some of the maxillary posterior teeth or the lingual mucosa, the anterior region of said upper surface sloping posteriorly upwardly and merging with the respective anterior regions of said second and third ridges whereby the incisal edges of the teeth are precluded from being moved more lingually than the root apices as the first ridge is urged against the gingival third of the maxillary anterior teeth.

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4,337,037

## FIXED LINGUAL ORTHODONTIC APPLIANCE FOR THE MAXILLARY ARCH

Craven H. Kurz, No. 6 N. Star, Apt. 106, Marina del Rey, Calif. 90291

Continuation-in-part of Ser. No. 120,146, Feb. 11, 1980, abandoned. This application Apr. 23, 1981, Ser. No. 256,961

Int. Cl.³ A61C 3/00

U.S. Cl. 433—8 7 Claims

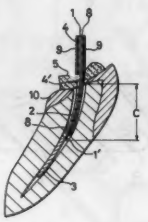
1. A lingual orthodontic appliance for the teeth of the maxillary arch comprising: a bracket shaped to fit between the lingual ridges of a particular tooth of the maxillary arch and shaped to fit the anatomy of the lingual surface of the particular tooth, and to be positioned over the cingulum area, the bracket having a slot extending mesiodistally for receiving an arch wire, and said bracket having an inclined bite plane formed on the lingual surface thereof in position to be engaged by the corresponding tooth of the mandibular arch and having a selected inclination such that as the corresponding tooth bites against the bite plane the resultant force direction is such that the bracket is forced against the lingual surface of the particular tooth by the occlusal force, so as to prevent the bracket from being sheared off the particular tooth by the corresponding mandibular tooth.

4,337,038

## ELECTROLYTIC IMPLEMENT AND METHOD FOR REMOVING METAL PIECES LEFT IN ROOT CANALS OF TEETH

Tsuyoshi Saito, and Masaru Ogiwara, both of Tokyo, Japan, assignors to M-S Surgical Mfg. Co., Ltd., Tokyo, Japan

Filed Oct. 21, 1980, Ser. No. 199,368
Claims priority, application Japan, Nov. 19, 1979, 54-148881
Int. Cl.[3] A61C *3/00*
U.S. Cl. 433—32 10 Claims



1. An electrolytic implement for removing a metal piece in the root canal of a tooth, comprising a positive electrode formed of a metal needle, said needle, except for a tip portion thereof, coated with an electrically insulating material, said tip portion adapted to come into contact with said metal piece; and a negative electrode formed by a metal tube coated, except for a tip portion thereof, with electrically insulating material; said metal needle fitting within the metal tube and being freely slidable therein.

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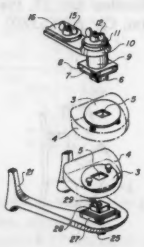
4,337,039

## PLASTERLESS ARTICULATOR

Raymond H. Martin, 88 Brisbon Rd., Somerset, Mass. 02726; Ugo S. Garganese, 1790 Warwick Ave., Warwick, R.I. 02889, and John R. Griffin, 5 Franconia St., Dorchester, Mass. 02122

Filed Sep. 4, 1979, Ser. No. 71,948
Int. Cl.[3] A61C *11/00*
U.S. Cl. 433—60 1 Claim



1. A plasterless dental articulator, model base former, ferromagnetic disc, for mounting and supporting an upper and lower dental models, said articulator comprising:

(A) A lower jaw frame, having a solid base to which a ferromagnetic cap with an encased square metal nut and magnet is attached to hold the lower model securely in place and, an upper jaw assembly consisting of a slide bar support having a horizontal axel with a lateral wheel on one end which attaches to the lower jaw frame to simulate the movement of the jaw; the slide bar support also having a threaded milled hole on either end, the distal hole to receive a vertical bolt and lock nut to establish the vertical opening of the upper and lower jaws; the anterior hole to receive a vertical bolt, a wing nut and a slide bar, said slide bar having an oblong opening inside most of its length which allows the slide bar to be moved fore, aft and laterally, the slide bar also having a cap shaped aperture with an opening on the anterior end through which an assembly of a swivel socket dome and machined domed washer is placed, with the upper portion of the assembly threaded to receive a wing nut to tighten the assembly and the lower portion having a ferromagnetic cap with an encased nut and a magnet to hold the upper model securely in place after which a slide bar and the swivel dome socket are tightened by means of the wing nuts,

(B) A flexible model base former having a square nipple in the center the same demensions as the nut on the articulator and a wall along its edge the same height as the center nipple,

(C) a ferromagnetic disc with retainers for securing into the base of the model and a square hole in the center, the exact dimensions to fit over the flexible nipple, so that the ferromagnetic disc will be transferred into the base of the model.

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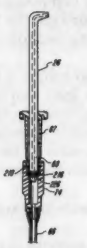
4,337,040

## ORAL HYGIENE APPLIANCES

Michael A. Cammack; Christopher W. Elkins; Clarence J. Hickman, and Keith M. Mullins, all of Ft. Collins, Colo., assignors to Teledyne Industries, Inc., Ft. Collins, Colo.

Division of Ser. No. 97,039, Nov. 23, 1979. This application Mar. 23, 1981, Ser. No. 246,611
Int. Cl.[3] A61C *17/02*
U.S. Cl. 433—80 1 Claim



1. In a device which includes a supply of liquid and means for delivering such liquid to a point of use, a coupling assembly which comprises:

an elongated coupling element having a cylindrical internal bore formed inwardly from one end of said element, a first portion of said bore having a predetermined diameter and a second more inward portion of said bore having a diameter of less than said predetermined diameter;

a cylindrical retaining sleeve longitudinally fixed within a second portion of said bore but projecting therein only to an extent which defines a lateral recess between the inner end of said sleeve and said first portion of said bore, the inner wall of said sleeve matching the diameter of said second portion and thereby effecting a continuation of said second portion outwardly beyond said recess;

an annular resilient O-ring floatingly seated in said recess and having a thickness less than the length of said recess but greater than the difference between the diameters of said first and second portions;

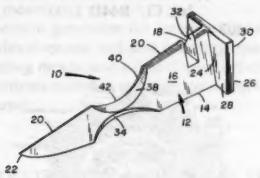
a cylindrical coupling member insertable within said sleeve and said second portion of said bore for accepting flow of said liquid;

and a circumferential groove defined on the exterior of the end portion of said member and engageably seating said O-ring upon insertion of said member within said sleeve.

## 4,337,041
## DENTAL WEDGE

John D. Harsany, 1 Marion Ave., Mansfield, Ohio 44903

Filed Sep. 29, 1980, Ser. No. 191,842
Int. Cl.³ A61C 7/00
U.S. Cl. 433—149 12 Claims




1. A unitary dental wedge for interproximal insertion in the interdental space between teeth comprising:

an elongated body being substantially triangular in cross section;

means for positively engaging said teeth thereby locking said body therebetween, said positive engagement and locking means comprising at least one depression disposed in a portion of said elongated body contacting one of said teeth when said body is interproximally disposed, said depression being concavely tapered to conform substantially to and for capturing and selectively retaining therein a part of said contacted portion of said tooth, said contacted portion of said tooth being an interproximal surface thereof, said at least one depression being contoured to substantially conform to said contacted interproximal surface; and

means for simulating the contour of the concave bulbous papillia of the gingiva disposed in the interdental space when said papillia is displaced by interproximal insertion of said dental wedge, said contour simulating means comprising a pair of recesses disposed in said elongated body, said recesses being contoured as said papillia, said elongated body portion including a pair of side portions meeting at a vertex edge and a base portion, one of said recesses being disposed in one of said sidewalls, the other of said recesses being disposed in the other of said sidewalls, said recesses being adjacent, merging together, and undercutting said vertex edge proximate thereto.

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## 4,337,042
## DENTAL ARRANGEMENT AND PROCESS FOR MANUFACTURING DENTURES

Frauke H. F. von Nostitz, Allescherstrasse 45, 8000 Munich 71, Fed. Rep. of Germany

Filed Oct. 6, 1980, Ser. No. 194,332
Claims priority, application Fed. Rep. of Germany, Oct. 17, 1979, 2942062
Int. Cl.³ A61C 13/22
U.S. Cl. 433—171 6 Claims

1. Dental arrangement for the manufacture of an artificial partial or total denture comprising at least two artificial teeth connected in natural sequence, characterized in that the artificial teeth are mounted along the roots side on a strip made of a plastic selected from acrylic or methacrylic esters which are flexible or remain soft in such a manner that the relative movement of the teeth with respect to one another horizontally as well as in the vertical direction is possible without disengagement of the teeth from the plastic strip.

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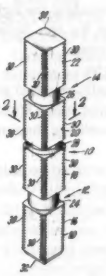
## 4,337,043
## DENTAL ANCHOR

Bernard Weissman, New York, N.Y., assignor to IPCO Corporation, White Plains, N.Y.

Filed Oct. 26, 1977, Ser. No. 845,628
Int. Cl.³ A61C 5/04
U.S. Cl. 433—225 6 Claims



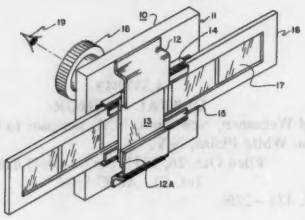
1. A dental anchor for insertion into a channel in a tooth, said dental anchor comprising an elongated body member, said body member having a first section with a substantially square cross-section to provide four longitudinal side surfaces joined by four longitudinal corner portions, each of said corner portions being provided with thread means for self tapping said one section into the channel when said body member is rotated about its longitudinal axis, said longitudinal side surfaces of said first section being spaced from walls of the channel when said first section is being threaded into the channel to reduce self tapping stresses, said body member having a second section along said longitudinal axis, a reduced thickness portion disposed intermediate said first section and second section to permit said second section to be bent relative to said first section after said first section is seated in the channel to provide an anchoring portion for a superstructure, said reduced thickness portion being cylindrical; and

said dental anchor further including a second elongated body member along said longitudinal axis, said second body member having a third section with a substantially square cross-section to provide another four longitudinal side surfaces joined by another four longitudinal corner portions, each of said another corner portions being provided with second thread means for self tapping said third section into a second channel when said second body member is rotated about said longitudinal axis, said another four longitudinal side surfaces of said third section being spaced from walls of the second channel when said third section is being threaded into the second channel to reduce self tapping stresses, and a frangible reduced thickness member connecting said second and third sections of said body members together, said reduced thickness cylindrical portion having a thickness greater than any thickness of said frangible reduced thickness member.

## 4,337,044
## NIGHT VISION TRAINING SIMULATOR

John E. Palmer, Springfield, Va., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Feb. 6, 1981, Ser. No. 232,333
Int. Cl.[3] G09B *19/00*
U.S. Cl. 434—11 10 Claims



1. A training aid to simulate the light images of a plurality of diverse targets created by the light emitting elements in a thermal viewer comprising:

a source of white light;

a record means optically coupled to said source to transform light from said source into a black and white image of said targets closely resembling the same target image produced by said viewer;

an eyepiece means coupled to said record means to focus said image for comfortable viewing; and

a light filter means mounted between said source and said eyepiece means to pass substantially only those quanta of light having the same frequency and spectral distribution as said light emitting elements.

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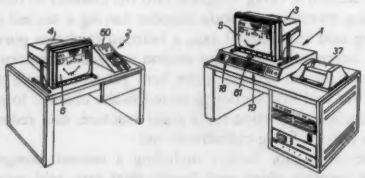
## 4,337,045
## NAVIGATION TRAINING AIDS

Frank Jones, Finchampstead, and Peter Tomlinson, Burleigh, both of England, assignors to Jones and Healy Marine Limited, Wokingham, England

Filed Aug. 21, 1980, Ser. No. 180,107
Int. Cl.[3] G09B *9/06*
U.S. Cl. 434—29 12 Claims

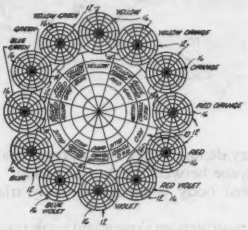


1. A ship navigation and handling training simulator comprising a first console for use by a student trainee and a second console for use by an instructor, at least one of said consoles having a screen to provide a mimic display of the ship and environmental information, two groups of controls for setting-in respectively the environmental and display information applicable to a navigational or handling exercise to be performed and information representing ship/tug control decisions by the student trainee, said second console being associated at least with the said group of controls for setting-in environmental and display information, and computer means programmed to control the display on a time scale in accordance with the information set-in on both said groups of controls and changes thereto during the course of the exercise.

## 4,337,046
## BASIC COLOR MEDIA SET FOR PROVIDING TONALLY MATCHED PALETTES

Martin C. Anderson, 2265 N. Oxford Rd., Oxford, Mich. 48051, and David T. Lonier, 10691 Williams, Taylor, Mich. 48180

Division of Ser. No. 43,279, May 29, 1980, Pat. No. 4,249,318, which is a continuation of Ser. No. 792,149, Apr. 29, 1977, abandoned. This application Nov. 19, 1980, Ser. No. 208,195
Int. Cl.[3] B44D *3/00*
U.S. Cl. 434—103 12 Claims



1. A color chart arrangement for use in preparing tonal palettes from a set of basic coloring materials, said color chart comprising a sequenced array of samples of said basic coloring materials, said sequenced array comprising successive groupings of three sample colors, said groupings comprising three respective primary color-related groupings, each grouping being related to a different primary color, each of said groupings comprised of one of said primary colors and the other two primary colors toned towards said one primary color, said color chart further comprising three tertiary primary-toned grays, one of each of said three tertiary grays interposed between successive groupings of said basic coloring material sample regions, said primary tone of said gray tertiary color sample being interposed between successive groupings toned towards the other two primary colors other than the tone of said primary-toned tertiary, whereby successive groupings of three of said sample regions throughout said ordered array of sample regions comprise sample colors of a tonal palette consisting of the corresponding three coloring materials.

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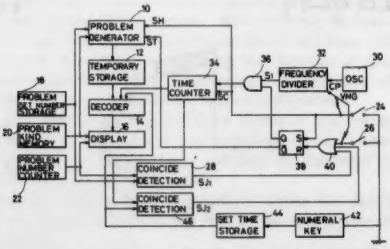
## 4,337,047
## TIME COUNTER CONTROLLED ELECTRONIC LEARNING AID

Koiti Hatta, Yamatokoriyama, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Nov. 28, 1979, Ser. No. 98,026
Claims priority, application Japan, Nov. 29, 1978, 53/164371[U]; Dec. 21, 1978, 53/183138[U]
Int. Cl.[3] G09B *7/00*
U.S. Cl. 434—201 11 Claims




1. An electronic learning aid wherein problems are automati-

cally developed and displayed on a display panel, a student introduces his answer after calculation with figures, and the introduced answer is compared with a correct answer stored in the electronic learning aid, said electronic learning aid comprisisng:

time counting means for counting a time period; a start instruction generator for initiating the automatic problem development and the counting operation of said time counting means;

a stop instruction generator for terminating said automatic problem development and said counting operation of said time counting means; and a first display driver for displaying the contents stored in said time counting means on said display panel.

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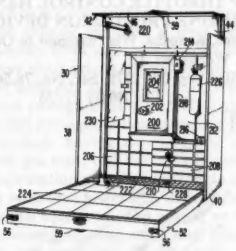
## 4,337,048
## CAREER OCCUPATION BASIC SKILLS TRAINING SYSTEM

**James E. Hatch, and Thomas W. Gannaway, both of Rochester, N.Y., assignors to The Singer Company, Stamford, Conn.**

**Continuation of Ser. No. 27,116, Apr. 4, 1979, abandoned. This application Oct. 14, 1980, Ser. No. 196,996**

**Int. Cl.³ G09B *19/00***

**U.S. Cl. 434—219** **10 Claims**



1. A self-contained training system for providing a realistic simulated work environment and instructing a participant in the use of tools related to a specific occupation and in the performance of basic tasks related to that specific occupation, comprising:

a folding cabinet including at least a rear wall and a base apron member adapted to support and partially enclose a participant when said cabinet is unfolded;

components, materials and tools actually used in performing predetermined basic tasks in the specific occupation;

means for mounting selected ones of the components and materials on the rear wall of said cabinet so as to simulate a work environment for the specific occupation, said simulated work environment being in need of tasks to be performed to change the physical characteristics of the components and materials; and

means for presenting an assigned simulated job task to the participant for performance by the participant utilizing the tools on the components and materials so as to physically manipulate and change the character of the components and materials;

whereby the participant is given an opportunity to acquire actual experience in the specific occupation.

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## 4,337,049
## METHOD AND SYSTEM FOR AUTOMATED TRAINING OF MANUAL SKILLS

**Edward M. Connelly, 1909 Hull Rd., Vienna, Va. 22180**

**Filed Jan. 9, 1981, Ser. No. 223,847**

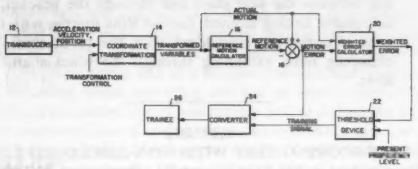
**Int. Cl.³ A63B *21/00***

**U.S. Cl. 434—247** **15 Claims**

1. A method for automated training of a subject having a given proficiency in manual skills, comprising the steps of:

(a) measuring body motion so as to derive a set of motion variables,

(b) comparing said motion variables to a reference motion to derive a motion error value,



(c) comparing said motion error value to a threshold error value corresponding inversely to said given proficiency level of said subject, and

(d) providing a training signal to said subject whenever said motion error value exceeds said threshold error value.

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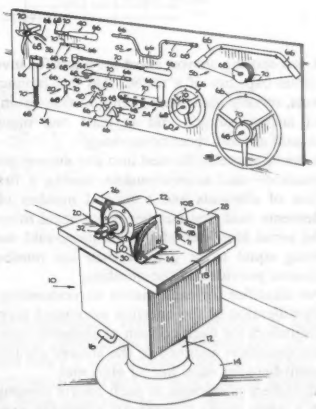
## 4,337,050
## METHOD AND APPARATUS FOR REHABILITATION OF DAMAGED LIMBS

**John Engalitcheff, Jr., Gibson Island, Md., assignor to Baltimore Therapeutic Equipment Company, Baltimore, Md.**

**Filed Dec. 3, 1979, Ser. No. 99,838**

**Int. Cl.³ A63B *21/24***

**U.S. Cl. 434—260** **6 Claims**



1. Apparatus for simulating the operation characteristics of different tools for rehabilitation of damaged limbs to use such tools, said apparatus comprising:

(a) a plurality of accessories of different sizes and configurations, each accessory having at least one handle of the size and shape of the handle of a tool being simulated;

(b) a coupler element;

(c) frame means interconnecting the handle to the coupler element in a manner such that movement of the handle through the path of movement of the tool handle being simulated produces rotation of the coupler element, the frame means for each accessory being different according to the tool being simulated and a coupler element of each accessory being of the same construction;

(d) a brake controlled shaft mounted for rotation about a fixed axis;

(e) a brake arranged to produce a predetermined resistance to rotation of the shaft;

(f) a cooperative accessory coupler on one end of the shaft to receive the coupler elements of the accessories, to support the accessories, and to communicate their movements to

the shaft, the coupler element of each accessory being removably connectable to the accessory coupler such that the accessory is supported by the shaft; and

(g) the shaft and brake being mounted on a bracket extending between a pair of side plates, with a pivot shaft extending between the side plate and through the bracket, the side plates having aligned, curved slots therein with their axes of curvature coincident with the pivot shaft, and clamping bolts extending through the bracket and the slots.

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**4,337,051**

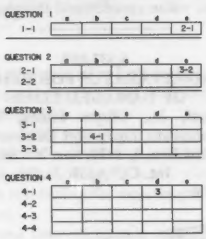
**SELF-SCORING TEST WITH NON-DISCLOSED KEY**

**Thomas Donlon, 113 King George Rd., Pennington, N.J. 08534**

**Filed Oct. 14, 1980, Ser. No. 196,833**

**Int. Cl.³ G09B *3/00***

**U.S. Cl. 434—328** **10 Claims**




1. A self-scoring answer sheet for a test for investigating the intellectual capacity of a testee, said test having at least two questions, serially identified; each question having at least one correct answer choice and at least one incorrect answer choice, said answer sheet comprising:

a. Answer elements formed into one answer matrix for each question—said answer matrix having a first number of lines of elements and a second number of columns of elements, said first number being equal to or greater than the serial identifier of the question, said second number being equal to or greater than the number of answer choices provided in the question;

b. An identifier for each matrix corresponding to the serial identification of the question associated therewith;

c. Identifiers for each column of elements corresponding to the identifiers assigned to the answer choices;

d. Identifiers for each line of elements;

e. Identifiers positioned in each matrix element and hidden by a latent image technology, subject to exposure by said testee.

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**4,337,052**

**WAVE ENERGY PROPELLING MARINE SHIP**

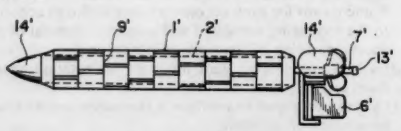
**Seiichi Kitabayashi, No. 919-12, Oaza Koshikiya, Ageo-shi, Saitama, Japan**

**Filed Oct. 11, 1979, Ser. No. 83,792**

**Claims priority, application Japan, Jul. 10, 1979, 54-86514**

**Int. Cl.³ B63H *19/02***

**U.S. Cl. 440—9** **1 Claim**




1. A wave energy propelled marine ship for disposition on or in the sea and comprising:

a cylindrical ship body having a hollow space therein for transporting fluid material therewithin;

propulsion means for propelling said marine ship;

rudder means for controlling the moving direction of the marine ship;

rotary means around substantially the overall peripheral surface of said ship body and rotatable therewith, said rotary means including a rotary shaft, a rotary hollow sleeve concentrically mounted upon said rotary shaft for rotation therewith in a single rotational direction, a plurality of plates arranged radially from the axis of said shaft to the inside surface of said rotary sleeve to securely form a plurality of water chambers and a plurality of water ports, each of said ports formed in the trailing edge of each water chamber adjacent to the radial plate of each water chamber wherein wave energy is converted into rotary mechanical energy;

transmission means for driving said propulsion means from said rotary means; and,

adjusting means for adjusting bouyancy of the whole marine ship so that the rotary means is positioned on the sea surface.

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**4,337,053**

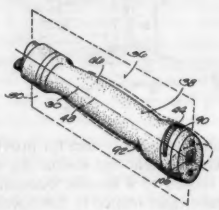
**IDLE ADJUSTMENT CONTROL AND SCULPTURED TWIST GRIP THROTTLE CONTROL HANDLE FOR A MARINE PROPULSION DEVICE**

**Myron T. Stevens, Kenosha, Wis., assignor to Outboard Marine Corporation, Waukegan, Ill.**

**Filed Sep. 24, 1979, Ser. No. 78,562**

**Int. Cl.³ B63H *21/26***

**U.S. Cl. 440—87** **3 Claims**

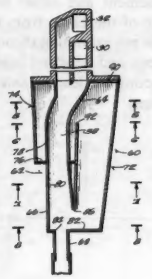


1. A marine propulsion device comprising a marine propulsion unit including an engine having a throttle movable between an idle position for operating said engine at an idle speed, an advanced position for operating said engine at a speed above the idle speed, and an advanced idle position adjacent to said idle position and between said idle position and said advanced position for operating said engine at a speed above the idle speed, said marine propulsion unit further including a rotatably mounted propeller operatively connected with said engine, a steering tiller attached to said marine propulsion unit and having a longitudinal axis, a throttle grip having an outer peripheral gripping surface extending axially of said longitudinal axis, said throttle grip being attached to said steering tiller for rotation relative to said longitudinal axis between a first position and a second position, throttle linkage means operatively connected with said throttle grip and said throttle for moving said throttle between said idle position and said advanced position in response to movement of said throttle grip between said first position and said second position, an idle adjustment knob having an outer peripheral side edge and being carried by said throttle grip for rotation with and relative to said throttle grip with a portion of said outer peripheral side edge extending radially from said longitudinal axis and outwardly beyond said outer peripheral gripping surface, and means operatively connecting said idle adjustment knob with said throttle linkage means for moving said throttle between said idle position and said advanced idle position in response to rotation of said idle adjustment knob relative to said throttle grip.

## 4,337,054
## OUTBOARD MOTOR INCLUDING FOLDED TUNED EXHAUST GAS PASSAGE

**Theodore J. Holtermann, Milwaukee, and Otto H. Scharpf, Brookfield, both of Wis., assignors to Outboard Marine Corporation, Waukegan, Ill.**

**Filed Mar. 17, 1980, Ser. No. 131,117**
**Int. Cl.³ B63H *21/26***
**U.S. Cl. 440—89** **18 Claims**

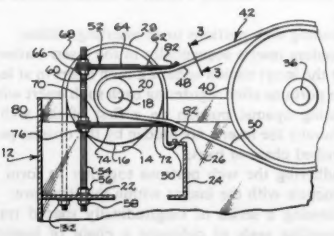


**1.** An outboard motor comprising a power head including an engine having an exhaust gas port, a drive shaft housing extending downwardly from said power head and including a lower end, a drive shaft driven by said engine, an exhaust gas discharge outlet adjacent said lower end, means defining a continuous folded passage housed in said drive shaft housing and including a first passage portion extending generally parallel to said drive shaft, having an upper end communicating with said exhaust gas port, and having a lower end, a second passage portion extending generally parallel to said drive shaft, communicating with said lower end of said first portion and extending upwardly therefrom, and having an upper end, and a third portion communicating with said upper end of said second portion and extending downwardly therefrom and including a transverse wall closing the end thereof, said folded passage also communicating with said exhaust gas discharge outlet, and a propeller supported for rotation by said lower end of said drive shaft housing and drivingly connected to said drive shaft.

## 4,337,055
## DRIVE BELT TENSIONING APPARATUS

**Duncan R. Mackay, Mountain View; Arthur K. Arnold, and Donald C. Holm, both of San Jose, all of Calif., assignors to Autotron Equipment Corporation, Mountain View, Calif.**

**Filed Mar. 10, 1980, Ser. No. 128,943**
**Int. Cl.³ F16H *7/12, 7/10***
**U.S. Cl. 474—111** **3 Claims**

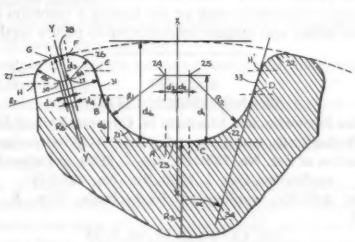


**1.** Apparatus for tensioning a drive belt that is trained around a driving sheave mounted on a first shaft and a driven sheave mounted on a second shaft supported substantially immovably in parallel spaced apart relation to said first shaft, said belt having a first and second belt run defined between said sheaves and disposed in spaced relation to each other, said apparatus comprising first and second elongate leaf springs each having a first end and a second end remote from said first end, and first and second spring mounting means for mounting said first end of each said spring substantially immovably with respect to said shafts, said first and second mounting means supporting an associated one of said springs to dispose said second end of said springs in rubbing contact with said belt on said first and second runs respectively and at a site intermediate said sheaves, said mounting means spporting said leaf springs to elastically deform an associated one of said springs and to deflect the belt on an associated one of said runs so as to tension the same, one of said sheaves being of a diameter smaller than the other said sheave and including an elongate rod mounted adjacent said smaller sheave, said elongate rod being spaced from said smaller sheave and being oriented substantially perpendicular to an imaginary line extending through said shafts, both said mounting means fixing the first ends of respective said springs at respective sites on said rod that are disposed on opposite sides of said smaller sheave.

## 4,337,056
## MECHANICAL POWER TRANSMISSION SYSTEM

**James A. Bruns, Itasca Pengilly, Minn., assignor to Uniroyal, Inc., New York, N.Y.**

**Continuation of Ser. No. 967,768, Dec. 8, 1978, Pat. No. 4,233,852. This application Nov. 17, 1980, Ser. No. 207,535**
**Claims priority, application United Kingdom, Dec. 12, 1977, 51992/77**
**Int. Cl.³ F16G *1/28***
**U.S. Cl. 474—153** **1 Claim**



**1.** A power transmission system comprising at least one pulley with teeth in combination with a flexible belt with teeth, the pulley teeth being a non-conjugate form of the belt teeth, the pulley teeth being separated by pulley cavity portions and the belt teeth being separated by belt cavity portions, each pulley tooth in longitudinal cross-section being symmetrical about a pulley tooth centerline intersecting with a center of said pulley, said pulley tooth including a tip portion and opposite flank portions extending from said tip portion, the tip portion being defined by first and second circular arcs on opposite sides of said pulley tooth centerline, the centers of curvature of said first and second arcs being displaced from each other on a circular arc having a common center with said pulley, a peripheral pulley segment at the outermost portion of said pulley tooth tip joining the first and second arcs, each said pulley cavity being symmetrical about a pulley cavity centerline intersecting with the center of said pulley, said pulley cavity being defined by a third and fourth circular arcs on opposite sides of said pulley cavity centerline extending into the flank portions of consecutive pulley teeth, the centers of curvature of said third and fourth arcs being displaced from each other on a circular arc having a common center with said pulley, a base pulley segment joining the third and fourth circular arcs to define a base portion of said pulley cavity, a first pulley flank segment connecting one of the third and fourth circular arcs and one of the first and second circular arcs, and a second pulley flank segment connecting the other

of the third and fourth circular arcs and the other of the first and second circular arcs, each belt tooth in longitudinal cross-section being symmetrical about a belt tooth centerline, said belt tooth being partially defined by fifth and sixth circular arcs intersecting at said belt tooth centerline and extending into opposite flank portions of said belt tooth, the centers of curvature of said fifth and sixth arcs being displaced from each other and equidistant from a line tangent to consecutive belt tooth cavities, said belt cavity being symmetrical about a belt cavity centerline and being partially defined by the fifth arc of one belt tooth and the sixth arc of a consecutive belt tooth, said belt cavity having a base portion defined by seventh and eighth arcs on opposite sides of said belt cavity centerline, the centers of curvature of said seventh and eighth arcs being displaced from each other and equidistant from said line tangent to consecutive belt tooth cavities, a belt segment at the innermost portion of said belt cavity joining the seventh and eighth arcs, portions of said seventh and eighth arcs extending toward the flank portions of consecutive belt teeth, the distance between the centers of curvature of said seventh and eighth arcs being selected to exceed the distance between the centers of curvature of said first and second arcs such that in no-load condition of the belt and pulley the width of the base portion of said belt cavity exceeds the width of said pulley tooth tip, and the center of curvature locations and the radii of said third, fourth, fifth and sixth circular arcs being selected such that in said no-load condition the height of said belt tooth along said belt tooth centerline measuring from the intersection of said fifth and sixth arcs to the intersection of said belt tooth centerline with the line tangent to consecutive belt tooth cavities exceeds the depth of said pulley cavity along said pulley cavity centerline measuring from the intersection of said base pulley segment with said pulley cavity centerline to the intersection of said pulley cavity centerline with an arc having a common center with said pulley and tangent to consecutive pulley teeth tips.

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**4,337,057**

## TRANSMISSION CHAIN

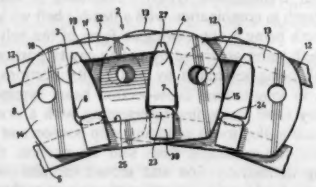
**Alexandre Horowitz, and Martinus H. Cuypers, both of Eindhoven, Netherlands, assignors to Varitrac AG, Switzerland**

**Continuation of Ser. No. 183,568, Sep. 2, 1980, abandoned. This application Oct. 1, 1980, Ser. No. 193,174**

**Claims priority, application Netherlands, Sep. 6, 1979, 7906681**

**Int. Cl.³ F16G *15/14, 5/18***

**U.S. Cl. 474—242** **24 Claims**



1. A transmission chain, comprising a plurality of links intercoupled by a plurality of hinge pins;

each link being comprised of a plurality of link elements; each link element being generally plate-like and having an opening therethrough, the opening being defined by opposed side walls at the leading and trailing sides of the opening;

each hinge pin having opposite, curved, lateral sides; between the lateral sides thereof, the hinge pin being narrower than the width of a link element opening between the opposed side walls of the opening;

one hinge pin extending through the opening in a first link element, and a first lateral side of the one hinge pin contacting the leading side of the opening in the first link element; a second hinge pin extending through the opening in the first link element, and a first lateral side of the second hinge pin contacting the trailing side of the opening in the first link element;

a second link element being positioned to the side of the first link element and offset in one direction along the length of the chain from the first link element; the one hinge pin extending through the opening in the second link element, and a second lateral side of the one hinge pin contacting the trailing side of the opening in the second link element;

a third link element also being positioned to the other side of the first link element and offset in the other direction along the length of the chain from the first link element; the second hinge pin extending through the opening in the third link element, and a second lateral side of the second hinge pin contacting the leading side of the opening in the third link element.

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**4,337,058**

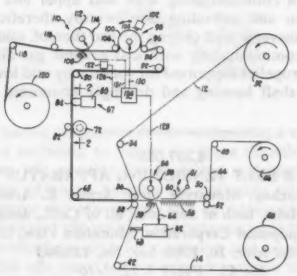
## METHOD OF MAKING A CONTAINER STRIP HAVING INSERTS

**Bernard Lerner, Peninsula, Ohio, assignor to Automated Packaging Systems, Inc., Twinsburg, Ohio**

**Continuation of Ser. No. 901,997, May 1, 1979, abandoned. This application May 19, 1980, Ser. No. 151,320**

**Int. Cl.³ B31B *23/74***

**U.S. Cl. 493—11** **5 Claims**



1. A process of making a chain of interconnected bags comprising:

(a) feeding web portions to an inserting station;

(b) feeding inserts sequentially to the insert station;

(c) at the insert station adhering each insert to at least one of the portions after registering each such insert with a cooperating opaque portion on a first of the web portions whereby the inserts are hidden by the opaque portion in a finished chain of bags;

(d) adhering the web portions together to form a tubular structure with the inserts within the structure;

(e) forming a series of longitudinally spaced transversely extending seals to delineate a chain of interconnected containers, each including at least one insert; and

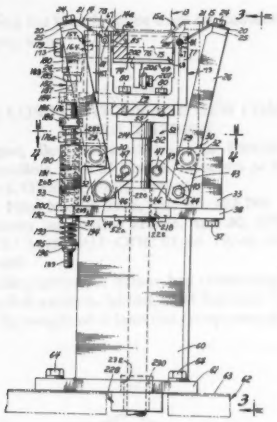
(f) forming a transverse line of weakness in each such container to produce a chain of end-to-end connected bags which are each facilely separable from the remainder of the tubular structure and each of which includes at least one of said inserts.

4,337,059

# CARTON BOTTOM TUCKING AND TACKING APPARATUS WITH PIVOTAL TUCKER WINGS FOR PACKAGING MACHINES

Robert J. Allen, 23025 Manning, Farmington, Mich. 48024, and Ivan L. Kauffman, 5145 Elkin Rd., Commerce Township, Oakland County, Mich. 48085

Filed Jun. 25, 1979, Ser. No. 51,785
Int. Cl.[3] B31B *1/28*
U.S. Cl. 493—184 5 Claims



1. A carton bottom tucker-tacker assembly for use in a packaging machine for forming, filling and closing the bottom ends of a pair of cartons, and wherein said packaging machine includes at least two carton mandrels for holding a pair of cartons in side-by-side positions for closing the bottom end closure members of the pair of cartons after said bottom ends have been heated, and wherein said bottom end closure members include a pair of hingedly mounted opposed triangular closure members and a pair of opposed tuck-in and tuck-over flaps disposed perpendicular to the triangular closure members, characterized in that the tucker-tacker assembly includes:

(a) a tucker apparatus operatively mounted at a carton bottom forming station in the packaging machine beneath each one of said pair of cartons for simultaneous engagement with the bottom closure triangular members of said pair of cartons retained on the pair of carton mandrels for breaking and partially folding the same toward a closed position;

(b) a tucker jaw swingably mounted at said carton bottom forming station beneath each of said pair of cartons for engaging simultaneously the partially closed bottom closure tuck-in flap members of each of said pair of cartons and moving the tuck-in flap members thereof toward closed positions;

(c) a tacker jaw swingably mounted at said carton bottom forming station beneath each of said pair of cartons for engaging simultaneously the partially closed bottom closure tuck-over flap members of each of said pair of cartons and moving the tuck-over panel members thereof toward closed positions and tacking the closed bottom closure members in place;

(d) power drive means for operating each of the tucker apparatuses, the tucker jaws and the tacker jaws;

(e) each of said tucker apparatuses including a pair of opposed tucker wings, each of said tucker wings including a formed inner end that has converging tapered edges for engagement with a bottom end triangular closure member on one of said pair of cartons for breaking and partially folding the same when the tucker wing is moved from a retracted outward position to an advanced inward position;

(f) a mounting plate supported on the packaging machine;

(g) means for swingably mounting each of said pair of opposed tucker wings of each tucker apparatus for swinging movement between said retracted outward and advanced inward positions;

(h) a movable pivot block member operatively connected to said power drive means;

(i) toggle link means interconnecting said pivot block and tucker wings;

(j) a carrier plate mounted on said pivot block for movement therewith;

(k) means for pivotally mounting said tucker and tacker jaws on said carrier plate; and

(l) a plurality of spring-loaded control rods operatively connected to said tucker and tacker jaws for coaction with the carrier plate when it is moved with said pivot block to swing the tucker and tacker jaws from retracted inoperative positions to inwardly advanced operative positions for folding the tuck-in and tuck-over flaps of the pair of cartons to closed and tacked positions.

4,337,060

## METHOD OF BLEACHING TEXTILE MATERIALS

Edward A. Dalmas, Valdese, N.C., assignor to Villar, Inc., Icard, N.C.

Filed Jun. 18, 1981, Ser. No. 275,108
Int. Cl.³ D06L 3/02; D21C 9/16
U.S. Cl. 8—111 15 Claims

1. A method of bleaching cellulosic materials comprising:
(a) providing a bleach liquor composed of water, hydrogen peroxide and potassium orthosilicate;
(b) immersing the cellulosic materials in the bleach liquor of step (a);
(c) separating the bleach liquor from the cellulosic materials and drying same.

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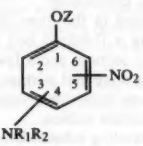
4,337,061

## HAIR DYE COMPOSITIONS AND NEW COMPOUNDS USEFUL THEREIN

Andree Bugaut, Boulogne-sur-Seine, and Patrick Andrillon, Aulnay-sous-Bois, both of France, assignors to Societe Anonyme dite: L'OREAL, Paris, France

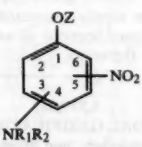
Filed May 3, 1976, Ser. No. 682,798
Claims priority, application France, Apr. 30, 1976, 76 12985
Int. Cl.³ A61K 7/13; C07C 93/14, 79/46, 103/29
U.S. Cl. 8—405 44 Claims

1. A dye composition for human hair comprising an aqueous or water-alcohol solution, having a pH between 3 and 11.5, of 0.001 to 5% by weight of at least one compound of the formula




wherein
Z is lower alkyl having 1 to 6 carbon atoms and substituted by a member selected from the group consisting of —OH, $—NH_2$, $—N(R_3)_2$, —COOH, $—CONH_2$ and —RCOOR', wherein $R_3$ is hydrogen or lower alkyl having 1–6 carbon atoms and R and R' are lower alkyl having 1–6 carbon atoms,
each of $R_1$ and $R_2$ is H or lower alkyl having 1 to 6 carbon atoms,
the $—NO_2$ substituent is in the 2, 3, 4, 5 or 6 position on the ring and the $—NR_1R_2$ substituent occupies any remaining position on the ring.

41. A compound of the formula




wherein
Z is lower alkyl having 1–6 carbon atoms and substituted by —OH, $—NH_2$, $—N(R_3)_2$, —COOH, $—CONH_2$ and 13 RCOOR', wherein $R_3$ is hydrogen or lower alkyl having 1–6 carbon atoms and R and R' are lower alkyl having 1–6 carbon atoms, and
each of $R_1$ and $R_2$ is hydrogen or alkyl of 1 to 6 carbon atoms,
the $—NO_2$ substituent is in the 2, 3, 4, 5 or 6 position on the ring and the $—NR_1R_2$ substituent occupies any remaining position on the ring, with the proviso that when Z is said lower alkyl substituted by —OH and is $\beta$-hydroxy ethyl and $—NO_2$ is in the 4-position and $—NR_1R_2$ is in the 2-position then either $R_1$ or $R_2$ is other than hydrogen.

43. The compound of claim 41 which is (3-nitro-4-amino) phenoxyethanol.

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4,337,062

## ANTI-MIGRATION AGENT FOR DYEING

Hirosuke Imai; Teruaki Yamanashi, and Hiroyuki Itoh, all of Yokohama, Japan, assignors to Nippon Oil Company, Ltd., Tokyo, Japan

Continuation of Ser. No. 73,328, Sep. 7, 1979, abandoned. This application Nov. 20, 1980, Ser. No. 208,496
Int. Cl.³ D06P 1/52, 1/16, 1/41
U.S. Cl. 8—557 3 Claims

1. In a process for dyeing employing an anti-migration agent, the improvement which comprises employing as the anti-migration agent a water-soluble, neutral polymer salt of a polymer anion and at least one cation, said polymer anion being an alternate copolymer or a partial esterificate thereof, said copolymer consisting of at least one monomer selected from the group consisting of $C_4$ to $C_7$ conjugated diene and isobutylene and at least one member selected from the group consisting of maleic acid, maleic anhydride and derivatives thereof, and having an intrinsic viscosity measured in cyclohexanone at 30° C. of from 0.4 to 5.0 and said cation being selected from the group consisting of $Na^+$, $K^+$, $Li^+$ and ammonium ions represented by the general formula $R_1R_2R_3R_4N^+$ wherein $R_1$, $R_2$, $R_3$ and $R_4$ are selected from the group consisting of hydrogen, $C_1$ to $C_6$ alkyl, cycloalkyl and phenyl.

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4,337,063

## COMPETITIVE IMMUNOASSAY USING SPECTRAL SENSITIZER LABEL

Yuji Mihara; Nobuhito Masuda, both of Minami-ashigara; Nobuo Hiratsuka; Takushi, both of Miyazako, Tokyo, and Tadashi Ikeda, Minami-ashigara, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Mar. 3, 1980, Ser. No. 126,920
Claims priority, application Japan, Mar. 1, 1979, 54-23964
Int. Cl.³ G01N 33/54, 33/58
U.S. Cl. 23—230 B 4 Claims

1. A method of performing a competitive immunoassay for a trace component in a sample comprising:
(a) adding a labeled antigen or labeled antibody to said sample in a competitive immunoassay protocol, said label being a spectral sensitizer,
(b) permitting the immune reactions to take place,
(c) separating the free labeled antigen or free labeled antibody from the resulting bound labeled antigen or bound labeled antibody,
(d) contacting either the free labeled immunochemical or the bound labeled immunochemical with silver halide, said immunochemical being either antigen or antibody,
(e) exposing the resultant of step (d) to light having a wavelength which the spectral sensitizer label absorbs,
(f) developing the exposed silver halide, and
(g) measuring the optical density resulting from step (f).

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4,337,064

## ALBUMIN DETERMINATION METHOD

E. Melvin Gindler, Union City, Calif., assignor to Sherwood Medical Industries Inc., St. Louis, Mo.

Continuation-in-part of Ser. No. 106,028, Dec. 21, 1979, abandoned, which is a continuation of Ser. No. 895,084, Apr. 10, 1978, abandoned, which is a continuation of Ser. No. 693,866, Jun. 8, 1976, abandoned. This application Sep. 22, 1980, Ser. No. 189,777
Int. Cl.³ G01N 33/48; C09K 3/00
U.S. Cl. 23—230 B 9 Claims

1. In a method for the colorimetric or spectrophotometric determination of analyte albumin concentration in a fluid using

an albumin specie specific dye-based color reagent, said method comprising the steps of:

(a) adding said color reagent to said fluid whereby a colored complex is formed with the analyte albumin;

(b) exposing said fluid to a light source; and

(c) measuring the degree of light absorption and determining the concentration of analyte albumin in said fluid by comparison of said measured degree of light absorption with the measured degree of light absorption obtained from at least one similarly treated standard solution containing a known concentration of albumin, the improvement wherein:

said standard solution comprises an aqueous solution of known concentration of albumin of different specie than the analyte and a water soluble surfactant containing at least one hydrophobic group containing at least about nine contiguous carbon atoms and also containing a hydrophilic group, said surfactant being present in an amount such that said standard solution mimics, with respect to spectrophotometric response, an aqueous solution of the analyte albumin when said standard solution and said analyte solution contain the same concentration of albumin and color reagent and said analyte solution is free of said surfactant in said amount.

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**4,337,065**

## METHOD FOR IMMUNOLOGICAL ASSAY USING MULTILAYER ANALYSIS SHEET

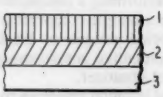
**Nobuo Hiratsuka, Tokyo; Yuji Mihara, Minami-ashigar shi; Nobuhito Masuda, Minami-ashigarashi, and Takushi Miyazako, Minami-ashigarashi, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan**

**Filed Sep. 29, 1980, Ser. No. 191,784**

**Claims priority, application Japan, Sep. 27, 1979, 54-124514**

**Int. Cl.³ G01N *33/54, 33/58, 33/52***

**U.S. Cl. 23—230 B** **9 Claims**




1. A method of performing a competitive immunoassay for a trace component in a sample comprising:

(a) adding a labelled antigen or labelled antibody to said sample in a competitive immunoassay protocol, said label being selected from the group consisting of a spectral sensitizer and a fogging agent,

(b) permitting the immune reactions to take place,

(c) contacting the resulting reaction mixture with a multilayer analysis sheet comprising a support having provided thereon, in sequence, (1) a silver halide light sensitive layer and (2) a free labelled immunochemical/bound labelled immunochemical separating layer,

(d) contacting either the free labelled immunochemical or the bound immunochemical which has passed through said separating layer with said silver halide light sensitive layer, said immunochemical being either antigen or antibody,

(e) when said label is said spectral sensitizer, exposing the resultant product of step (d) to light having a wavelength which the spectral sensitizer label absorbs,

(f) developing the multilayer analysis sheet; and

(g) measuring the optical density resulting from step (f).

**4,337,066**

## APPARATUS FOR THERMALLY DECOMPOSING AND GASIFYING COMBUSTIBLE MATERIAL IN A SINGLE FLUIDIZED REACTOR

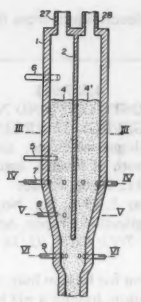
**Daizo Kunii, No. 25-16, Nakamachi 1, Meguro-ku, Tokyo, Japan**

**Filed Jan. 3, 1980, Ser. No. 109,294**

**Claims priority, application Japan, Jul. 11, 1979, 54-87584**

**Int. Cl.³ C10J *3/56***

**U.S. Cl. 48—63** **8 Claims**



1. An apparatus for thermally decomposing and gasifying combustible material, comprising:

a reactor constructed in the form of a cylindrical hollow tower containing a fluidized bed and having an upper section, a middle section, and a lower section, the lower section including a tapered portion, and the length of the tower being more than three times as long as its inner diameter at its middle section;

a first partition extending substantially in the vertical direction within the tower such that the upper section of the tower is divided into two sections;

a second partition intersecting the first partition in the middle portion of the tower at substantially a right angle thereto, said second partition extending lower than said first partition and into said lower section to a location above the bottom such that the interior of the tower is divided into four space sections at the middle section and into two space sections at the lower section;

a plurality of steam supply connected feed ports formed at both space sections of said lower section for supplying steam thereinto;

a plurality of air or oxygen supply connected feed ports formed at two space sections of said middle section for supplying air or mixture gas of oxygen thereinto; and

a plurality of steam supply connected feed ports formed at the other two space sections of said middle section for supplying steam thereinto.

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**4,337,067**

## COAL GASIFICATION

**Walter Jäger, Engelskirchen, and Herbert von Waclawiczek, Bergisch Gladbach, both of Fed. Rep. of Germany, assignors to GHT Gesellschaft fur Hochtemperaturreaktor-Technik mbH, Bergisch Gladbach, Fed. Rep. of Germany**

**PCT No. PCT/DE79/00092, § 371 Date Apr. 29, 1980, § 102(e) Date Apr. 29, 1980, PCT Pub. No. WO80/00441, PCT Pub. Date Mar. 20, 1980**

**PCT Filed Aug. 21, 1979, Ser. No. 195,195**

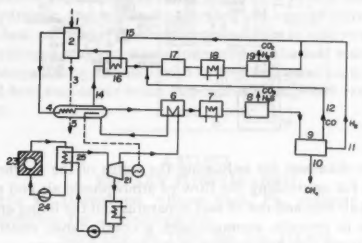
**Claims priority, application Fed. Rep. of Germany, Aug. 31, 1978, 2837952**

**Int. Cl.³ C10J *3/10, 3/18***

**U.S. Cl. 48—202** **2 Claims**

1. Method for generating methane or synthesis gas from carbon-containing materials utilizing nuclear energy which

comprises subjecting the carbon-containing material to hydrogenation in a hydrogenation-gasifier to convert part of the carbon in the carbon-containing material to gaseous constituents containing methane which are released from the hydrogenation-gasifier, introducing a hydrogen-containing gas into the hydrogenation-gasifier, passing residual unvaporized carbonaceous material from the hydrogenation-gasifier to convert the carbon in the residual carbonaceous material to gases containing synthesis gas which are released from an outlet of the steam gasifier, heating the steam gasifier by heat



exchange with the gaseous constituents released from the hydrogenation-gasifier, electrically heating the steam gasifier at its output stage, heating the hydrogen containing gas entering the hydrogenation-gasifier by heat exchange with the gases containing synthesis gas released from the steam gasifier, generating heat in a nuclear reactor, transferring said heat to a steam generator as a sole coupling between the above gasification operation and the nuclear reactor, and utilizing steam from said steam generator for process steam and for generating electricity for said electrically heating in the above operation for gasifying carbon-containing material.

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**4,337,068**

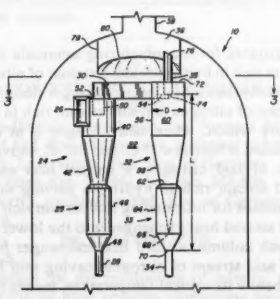
## METHODS FOR REMOVING ENTRAINED SOLIDS FROM GASES

**John P. MacLean, Stafford; J. Edward Cantwell, Houston; John D. Brown, The Woodlands, and Harold D. Hoy, Bridge City, all of Tex., assignors to Texaco Inc., White Plains, N.Y.**

**Continuation-in-part of Ser. No. 38,755, May 14, 1979, abandoned, which is a continuation-in-part of Ser. No. 865,051, Dec. 27, 1977, abandoned. This application Oct. 20, 1980, Ser. No. 198,416**

**Int. Cl.**[3] **B01D** *45/16*

**U.S. Cl. 55—1** **7 Claims**



**1.** A method for removal of entrained solids from gases in an upright cyclone separator (**33**, FIG. 2) comprising an upper cylindrical portion having a diameter D, and a lower conical portion, said upper cylindrical portion having an inlet (**54**) with a cross-sectional area (I), and an outlet (**74**) with a cross-sectional area (O), a dust bowl (**33**) connected to said cyclone lower conical portion having a barrel section (**64**) and a conical section (**66**) connected thereto at a junction, said cyclone lower conical portion having an apex passing substantially to or below said junction, and a dipleg (**34**) attached to the conical section of the dust bowl comprising the steps,

(a) injecting the gases with entrained solids in the inlet (**54**) of the cyclone separator in the range of substantially 52 feet per second to 80 feet per second,

(b) spinning the injected gases with the entrained solids around and down the cyclone separator to a vertical distance (L) comprising the distance between the gas outlet (**74**) and the inlet (**70**) of the dipleg, whereby L/D=about 4, and

(c) ejecting the solids-free-gases through the gas outlet (**74**) in the range of substantially 52 feet per second to 200 feet per second, whereby the range of O/I=0.4/1 to 1/1 for providing a maximum efficiency with minimum erosion of both the cyclone separator internal wall surface and of the separated solids.

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**4,337,069**

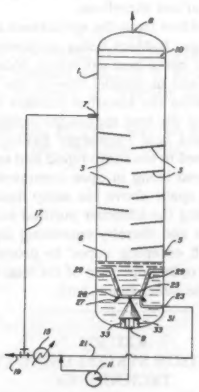
## GAS PHASE OLEFIN POLYMERIZATION RECYCLE GAS SCRUBBING TOWER

**Paul M. German, Jr., Friendswood; James A. Lamont, Alvin, both of Tex., and John C. Gee, Oswego, Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.**

**Filed Apr. 25, 1980, Ser. No. 143,535**

**Int. Cl.**[3] **B01D** *53/00, 57/00;* **B01F** *3/08*

**U.S. Cl. 55—229** **3 Claims**



**1.** In an apparatus in which a liquid phase is withdrawn rapidly through an exit port from a chamber comprising a chamber and an exit port located in the bottom portion of such chamber, the improvement comprising (a) an array of eductors through which liquid is passed and (b) a cone-shaped structure, the base of which is at least as large as the exit port and placed above the exit port such that the distance between the exit port and the base of such structure is about 0.5 to about 1.5 times the diameter of the exit port; wherein the array of eductors is positioned above and in proximity to the cone-shaped structure and below a predetermined height below which liquid normally is present and liquid flow from said eductors is directed downward such that said flow cooperates with said cone-shaped structure to create complete agitation of said liquid around said cone-shaped structure.

4,337,070

## CONTINUOUS SYSTEM OF RECTIFICATION

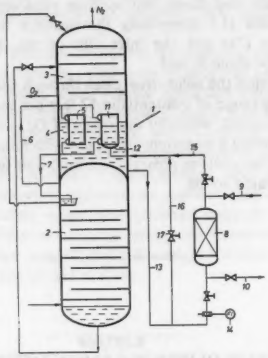
Wilhelm Rohde, Munich, Fed. Rep. of Germany, assignor to Linde Aktiengesellschaft, Wiesbaden, Fed. Rep. of Germany

Filed May 30, 1980, Ser. No. 154,676

Claims priority, application Fed. Rep. of Germany, May 30, 1979, 2922028

Int. Cl.³ F25J 3/04

U.S. Cl. 62—18 16 Claims



1. In a process for conducting the fractionation of a gaseous mixture by rectification, wherein liquid in the sump of a rectifying column is heated and thereby partially vaporized, and simultaneously sump liquid is withdrawn from a lower zone of the sump liquid bath and is remixed with the bath above the point of withdrawal, the improvement comprising the steps of:

passing the withdrawn sump liquid through an adsorber for removing impurities therefrom;

separating gas bubbles from the withdrawn sump liquid, said separating of gas bubbles being performed before recycling the liquid into a heat exchanger located in the rectifying column, and in parallel flow to the heat exchanger;

subsequently passing the adsorber purified sump liquid into the lower end of the heat exchanger located in the rectifying column, said heat exchanger having the lower end thereof immersed in the sump liquid and sealed therefrom, and its upper end being in open communication with the gas containing space above the sump liquid; and

partially vaporizing the adsorber purified sump liquid in the heat exchanger and thereby entraining liquid in the heat exchanger with escaping vapor to propel the entrained liquid over the open upper rim of the heat exchanger to be remixed into the sump liquid bath.

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4,337,071

## AIR PURIFICATION SYSTEM USING CRYOGENIC TECHNIQUES

Lien C. Yang, 2107 Normanton Dr., La Canada, Calif. 91011

Filed Aug. 2, 1979, Ser. No. 63,143

Int. Cl.³ F25J 3/04

U.S. Cl. 62—37 15 Claims

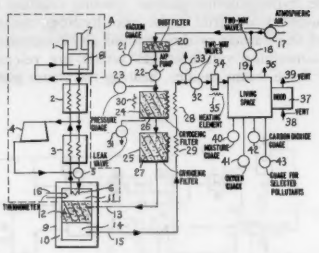
1. Apparatus for on-site purification of air for human respiratory consumption in living enclosures such as automobiles, homes, offices, and the like comprising:

a closed-cycle cryogenic refrigerator communicating with said living enclosure and further having an atmospheric air inlet means communicating with a source of outside air and a purified air outlet means coupled to the living enclosure;

a plurality of air purification chambers interposed between said atmospheric air inlet means, said refrigerator, and said purified air outlet means and being in communication therewith;

air circulation means coupled with said inlet and outlet means to provide circulation of air between said source of atmospheric air and said purified air outlet means; and

a plurality of electrical monitoring instruments and control devices connected with said plurality of said air purification chambers for indicating the status of the air therein and for controlling the flow of atmospheric air and purified air into and out of said apparatus and the living enclosure to provide, economically, a comfortable, relatively pollution free atmosphere in the living enclosure.



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4,337,072

## METHOD AND APPARATUS FOR MANUFACTURING AMMONIA SYNTHESIS GAS FROM A STREAM OF GAS RICH IN HYDROGEN AND A STREAM OF NITROGEN

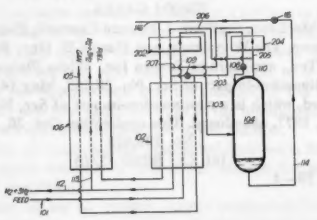
Brian A. McNeil, Chessington, England, assignor to Air Products and Chemicals, Inc., Allentown, Pa.

Division of Ser. No. 115,302, Jan. 25, 1980, Pat. No. 4,239,647. This application Jul. 14, 1980, Ser. No. 167,983

Claims priority, application United Kingdom, Mar. 8, 1979, 7908136; Nov. 2, 1979, 7938046

Int. Cl.³ F25J 3/00, 5/00

U.S. Cl. 62—42 8 Claims



1. An apparatus for manufacturing ammonia synthesis gas from a stream rich in hydrogen and a stream of nitrogen, which installation comprises a first heat exchanger designed for cooling said stream of nitrogen and said stream rich in hydrogen to a temperature which, when said nitrogen is at or above its critical pressure, is between 8° C. and 28° C. above the critical temperature of said nitrogen, a second heat exchanger for cooling said stream rich in hydrogen leaving said first heat exchanger; means for introducing said stream rich in hydrogen leaving said second heat exchanger into the lower portion of a nitrogen wash column, a third heat exchanger for cooling a first part of said stream of nitrogen leaving said first heat exchanger to below its critical temperature, means for introducing the stream of nitrogen leaving said third heat exchanger into the top of said nitrogen wash column as reflux, means for dividing the conveyed vapour consisting essentially of hydrogen and nitrogen exiting from the top of said nitrogen wash column into two streams and means for conveying one of said streams through said second heat exchanger in countercurrent flow to said stream rich in hydrogen and means for conveying the other of said streams through said third heat exchanger in

countercurrent flow to said stream of nitrogen, means for combining said two streams consisting essentially of hydrogen and nitrogen leaving said second and third heat exchangers and the balance of said nitrogen leaving said first heat exchanger to form ammonia synthesis gas and means for conveying said ammonia synthesis gas through said first heat exchanger in countercurrent flow to said stream rich in hydrogen and said stream of nitrogen, means for expanding liquid (containing impurities washed out of said stream rich in hydrogen leaving the bottom of said nitrogen wash column and passing the two phase mixture thus formed through said second heat exchanger wherein it vaporises in countercurrent flow to said stream rich in hydrogen, and means for carrying the vapour through said first heat exchanger in countercurrent flow to said stream rich in hydrogen and said stream of nitrogen, the said second heat exchanger being disposed with its cold end uppermost and said third heat exchanger being disposed with its warm end uppermost.

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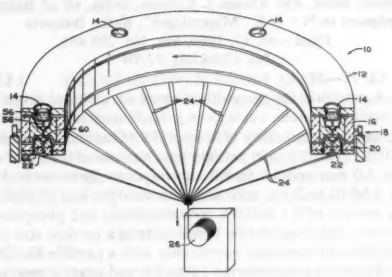
**4,337,073**

## ROTARY FOREHEARTH

**Warren W. Drummond, Allison Park, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.**

**Filed Dec. 30, 1980, Ser. No. 221,486**
**Int. Cl.³ C03B *37/025***
**U.S. Cl. 65—1** **23 Claims**



**23**. A process of forming glass fiber filaments comprising passing a molten glass stream into a plurality of streams of small cross-sectional area in a rotating channel, feeding small streams of molten glass from said rotating channel to a second channel continuously, feeding molten glass from said second channel to a glass fiber forming bushing continuously while maintaining the temperatures of the channels and glass contained therein constant.

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**4,337,074**

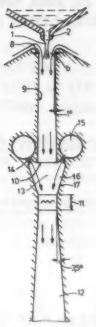
## PROCESS FOR PRODUCTION OF MINERAL WOOL FIBERS

**Edgar Muschelknautz, Leverkusen, and Norbert Rink, Dormagen, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany**

**Filed Apr. 7, 1981, Ser. No. 251,808**
**Claims priority, application Fed. Rep. of Germany, Apr. 25, 1980, 3016114**
**Int. Cl.³ C03B *37/06***
**U.S. Cl. 65—5** **6 Claims**

**1**. In a process for the production of mineral wool fibers according to the jet blast process, comprising issuing at least one melt stream from at least one opening in the base of a melting crucible into a converging-diverging drawing nozzle, flowing a gaseous blasting medium into the nozzle substantially parallel to the melt stream so as to separate the melt stream into fibers, the blasting medium being drawn into the nozzle by suction due to a pressute drop produced between the nozzle inlet and outlet, and passing the fibers and spent blasting gas into a diffuser connected downstream of the nozzle to reduce the gas flow rate, the improvements which comprise effecting

(a) a maximum drop pressure in the inlet of the drawing nozzle;



(b) a minimum drop pressure in the diverging portion of the drawing nozzle over a maximum length without separation (transition) of the laminar boundary layer;

(c) the subsequent pressure conversion initially with a shock at a constant cross-section of the drawing nozzle and subsequently in a subsonic diffuser.

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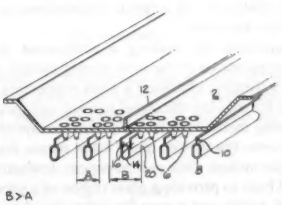
**4,337,075**

## TWIN CENTER COOLING FIN FOR TIP TYPE BUSHING

**John R. Mechel, Maumee, and Eric J. Brosch, Grand Rapids, both of Ohio, assignors to Manville Service Corporation, Denver, Colo.**

**Filed Jun. 18, 1981, Ser. No. 274,945**
**Int. Cl.³ C03B *37/025***
**U.S. Cl. 65—12** **2 Claims**



**1**. In a bushing for holding molten material from which fibers are formed wherein the bottom of the bushing is formed by an orifice tip plate having a plurality of rows of orifice tips and a plurality of oval shaped cooling tubes supported beneath said bushing and extending parallel to the rows of orifice tips and wherein each cooling tube is provided with a longitudinally extending cooling fin secured to the top thereof, the improvement comprising:

(a) a cooling tube extending along a longitudinal center line of said bushing; and

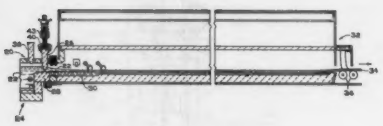
(b) a plurality of parallel longitudinally extending cooling fins, one of said cooling fins secured to each side of the top of said cooling tube.

4,337,076

## RIBBON EDGE DETECTOR AND SYSTEM FOR METERING FLOW OF MOLTEN GLASS

Hugh E. Shaw, Jr., Crystal City, Mo., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Nov. 26, 1980, Ser. No. 210,447
Int. Cl.³ C03B 18/10
U.S. Cl. 65—29 32 Claims



1. A method of sensing an edge of a substrate supported on a conductive surface, comprising the steps of:

positioning a conductive member in spaced relation to the conductive surface;

electrically connecting the conductive member and conductive surface to a power source to provide a capacitor having a voltage output; and

monitoring the voltage output of the capacitor as the conductive member moves relative to the substrate edge to detect the substrate edge.

9. An apparatus for following the edge of a substrate advancing along a substrate path on a conductive surface, comprising:

a conductive member;

means for moving said member across the conductive surface;

electrical means including a power source connected to said conductive member and the conductive surface to provide a capacitor having a first output voltage when said conductive member is over the conductive surface, second output voltage when said conductive member is over the substrate and a third output voltage when said conductive member is over a portion of the conductive surface and an edge portion of the substrate; and

means responsive to the output voltage of said capacitor and acting on said moving means to move said conductive member relative to the edge of the substrate to follow the edge of the substrate.

29. An apparatus for making a continuous glass ribbon wherein the apparatus is of the type having molten metal batch contained in a forming chamber; a glass supporting member; a tweel; means for moving the tweel toward and away from the glass supporting member to meter a predetermined amount of molten glass onto the molten metal bath; means for controllably cooling the molten glass as it advances downstream on the molten metal bath to provide a glass ribbon of a predetermined thickness and width; and means for removing the glass ribbon from the molten metal bath, comprising:

means for measuring linear displacement, said measuring means including a reciprocating member;

means for mounting said measuring means to structure of the apparatus adjacent a side of the tweel;

means for connecting said reciprocating member of said measuring means directly to the tweel to generate an output signal from said measuring means as a direct function of movement and direction of tweel displacement relative to the glass supporting member; and

means for monitoring the output signal of said measuring means to determine the movement and direction of the tweel displacement relative to the glass supporting member.

4,337,077

## AGRICULTURAL INOCULANT COMPOSITION

Joseph P. Rutherford, 3203 Rocks Chrome Hill Rd., Jarrettsville, Md. 21084

Filed Sep. 9, 1980, Ser. No. 185,557
Int. Cl.³ C05F 11/02, 11/08
U.S. Cl. 71—9 16 Claims

1. An agricultural inoculant composition including:

(a) a peat humus base mixture consisting essentially of predetermined weight percentages of peat moss, leather meal, granite meal, Calcium Phosphate, tobacco meal, animal manure, kelp, greensand, liquid seaweed, and bacterial inoculant; and,

(b) a liquid seaweed base mixture consisting essentially of liquid seaweed, carbohydrates and polysaccharides, vitamins and liquid alfalfa, said liquid seaweed base mixture being blended with said peat humus base mixture in the approximate amount of 250.0 ml. of said liquid seaweed base mixture to 135.0 grams of said peat humus base mixture.

4,337,078

## SUBSTRATE FOR CULTIVATION OF AGRICULTURAL CROPS AND ROOTING OF GREEN CUTTINGS IN GREENHOUSES AND IN OPEN AIR

Georgi S. Petrov, Plovdiv; Ivan A. Petkov, Sofia; Hristo I. Etropolski, Sofia; Dimiter N. Dimitrov, Sofia; Nikolay N. Popov, Sofia, and Atanas I. Uzunov, Sofia, all of Bulgaria, assignors to N P S K "Mineralagro", Sofia, Bulgaria

Filed Nov. 17, 1980, Ser. No. 208,491
Int. Cl.³ C05F 11/04
U.S. Cl. 71—24 1 Claim

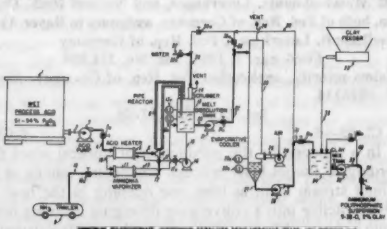
1. A substrate for the cultivation of agricultural crops and the rooting of green cuttings in greenhouses and in the open air, consisting essentially of klinoptylolite natural zeolite dried at 250° to 350° C. and in particle size fractions of 0.8 to 2.0 mm, 2.0 to 5.0 mm and 5.0 to 8.0 mm respectively in proportions from 1:1:0.01 to 2:3:1, enriched with nitrogen and phosphorus in an amount of 0.1 to 0.5% by nitrogenous and phosphorous fertilizers; fractionated raw vermiculite in a particle size of up to 1.0 mm and expanded vermiculite with a particle size of 5.0 to 15.0 mm in a proportion of 1:9 to 2:8; and organic mass peat, the proportion of the zeolite:vermiculite:peat being from 10:0.01:0.01 to 5:2:3.

4,337,079

## LOW POLYPHOSPHATE SUSPENSION FERTILIZERS FROM WET-PROCESS ACID

Horace C. Mann, Jr., Killen, and Robert S. Meline, Florence, both of Ala., assignors to Tennessee Valley Authority, Muscle Shoals, Ala.

Continuation-in-part of Ser. No. 194,642, Oct. 6, 1980, now Defensive Publication No. T101,802. This application May 18, 1981, Ser. No. 264,922
Int. Cl.³ C05B 7/00
U.S. Cl. 71—34 9 Claims



1. A process for preparing improved ammonium polyphosphate melts eminently suitable for ultimately preparing fertil-

izer base suspensions, which melts are produced from wet-process orthophosphoric acid and ammonia, and which base suspensions have markedly improved low temperature storage characteristics, which process comprises supplying a stream of vaporized ammonia heated to 50° F. to 200° F. to an enlarged diameter pipe reactor; supplying a stream of wet-process orthophosphoric acid heated to 50° F. to 210° F. and containing from about 50 to about 58 percent $P_2O_5$ to said enlarged pipe reactor; contacting said stream of heated vaporous ammonia with said stream of hot orthophosphoric acid at super atmospheric pressure and at temperatures in the range of about 400° F. to about 550° F. to form a resulting melt of ammonium polyphosphate wherein from about 10 to about 40 percent of the phosphorus values are converted to the nonortho acyclic species; controlling the flow rate of said stream of heated ammonia relative to the flow rate of said stream of heated orthophosphoric acid to maintain a total N:total $P_2O_5$ weight ratio in the range from about 0.265 to about 0.335 in said melt; controlling the flow rate of said stream of heated orthophosphoric acid introduced into said enlarged pipe reactor to range from about 15 to about 200 pounds of $P_2O_5$ per hour per square inch of reactor internal cross sectional area; controlling the throughput per unit volume of said stream of heated orthophosphoric acid introduced into said enlarged pipe reactor to range from about 0.2 to about 3 pounds of $P_2O_5$ per hour per cubic inch of reactor internal volume, and wherein the thermal energy required to heat said ammonia and said orthophosphoric acid is extracted solely and entirely from the heat of ammoniation of said phosphoric acid.

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**4,337,080**

## PLANT GROWTH REGULANTS

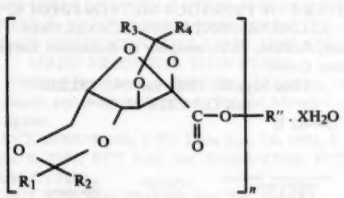
**William Szkrybalo, Verona, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.**

**Division of Ser. No. 559,209, Mar. 17, 1975, Pat. No. 4,007,206, which is a continuation-in-part of Ser. No. 335,607, Feb. 26, 1973, abandoned, which is a continuation-in-part of Ser. No. 277,538, Aug. 3, 1972, abandoned. This application Oct. 18, 1976, Ser. No. 733,567**

**Int. Cl.³ A01N *43/14***

**U.S. Cl. 71—88** **31 Claims**

1. A plant growth regulating composition comprising agriculturally acceptable adjuvants and, as the active ingredient, an amount effective in regulating plant growth of a compound of the formula



wherein, when n is 1, R″ is hydrogen, sodium, potassium, ammonium, substituted ammonium, straight or branched chain alkyl of from 1 to 20 carbon atoms, straight or branched chain alkenyl of from 2 to 20 carbon atoms, straight or branched chain alkynyl of from 2 to 20 carbon atoms or halo-lower alkyl and, when n is R″, is calcium or lower alkylene; $R_1$, $R_2$, $R_3$ and $R_4$ are hydrogen, straight or branched chain alkyl of from 1 to 7 carbon atoms, straight or branched chain alkenyl of from 2 to 7 carbon atoms, straight or branched chain alkynyl of from 2 to 7 carbon atoms, fluoro-lower alkyl, phenyl or phenyl having one or more substituents selected from the group consisting of alkyl, alkenyl, alkynyl, alkoxy and halo-lower alkoxy; n is an integer from 1 to 2 and X is a number from 0 to 1; enantiomers, racemates and salts thereof, and wherein the agriculturally acceptable adjuvants comprise, in percents by weight of the composition, from about 3% to about 10% of a surfactant, from about 1% to about 5% of an anti-caking compound, from about 0.1% to about 1% of an anti-foaming agent and from about 0.4% to about 1.5% of a buffer.

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**4,337,081**

## 5-AMIDO-3-TRIHALOMETHYL-1,2,4-THIADIAZOLES AND THEIR USE AS HERBICIDES

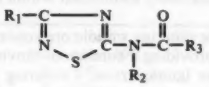
**Walter A. Gay, Cheshire, Conn., assignor to Olin Corporation, New Haven, Conn.**

**Filed Jan. 23, 1979, Ser. No. 6,302**

**Int. Cl.³ A01N *43/82*; C07D *285/08***

**U.S. Cl. 71—90** **2 Claims**

1. A method for controlling undesirable plant growth at a locus to be protected comprising applying to the locus a herbicidally effective amount of a compound of the formula:



wherein $R_1$ is $CCl_3$ or $CF_3$; $R_2$ is phenyl; and $R_3$ is a lower alkyl group having 2 to 4 carbon atoms, a phenyl group or $CX_3$ where X is H, Cl or F.

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**4,337,082**

## HERBICIDAL COMPOSITION COMPRISING TRIAZINONE COMPOUND

**Shunichi Hashimoto, Sonehigashi; Hiromichi Oshio, Osaka; Masato Mizutani, Kyoto; Yuzuru Sanemitsu, Hyogo; Haruhiko Katoh, Hyogo, and Seizo Sumida, Hyogo, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan**

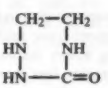
**Filed Feb. 10, 1981, Ser. No. 233,178**

**Claims priority, application Japan, Feb. 13, 1980, 55/17043; Feb. 19, 1980, 55/19914; Feb. 19, 1980, 55/19915**

**Int. Cl.³ C07D *253/06*; A01N *43/64***

**U.S. Cl. 71—93** **9 Claims**

6. A triazinone compound of the formula:



(Ib)

9. A method for controlling the growth of weeds and/or grasses which comprises applying a herbicidally effective amount of a triazinone compound of the formula:

(I)

wherein A is —NH—N=CHCH₂NH—, —NH—NHCH₂CH₂NH— or —NH—N=CHC(NHOH)=N— to the area where the weeds and/or grasses grow or will grow.

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**4,337,083**

## NON-POLLUTING, COOLING METHOD AND HEAT RECUPERATIVE SINTERING METHOD

**William T. Sweat, Salt Lake City, Utah, assignor to ASARCO Incorporated, New York, N.Y.**

**Filed Oct. 22, 1979, Ser. No. 86,880**

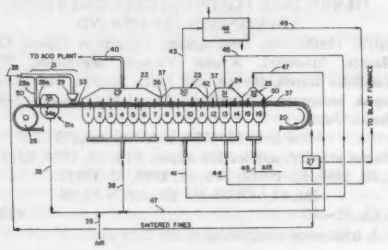
**Int. Cl.³ C22B *1/04, 1/20*; C26B *7/00***

**U.S. Cl. 75—5** **17 Claims**

1. A process for cooling a sintered strand including metallic

oxides from a first predetermined temperature to a second predetermined temperature comprising the steps of (a) continuously supplying said strand to a primary cooling zone, (b) blowing a gaseous stream which has a third predetermined temperature less than said first predetermined temperature through said strand in said primary cooling zone, said blowing step heating said gaseous stream to a fourth predetermined temperature, (c) removing said gaseous stream from said primary cooling zone, (d) cooling said removed gaseous stream to a fifth predetermined temperature, said fifth predetermined temperature being less than said third predetermined temperature, (e) continuously supplying said strand to a secondary cooling zone, (f) blowing said cooled gaseous stream through said strand in said secondary cooling zone, (g) removing said gaseous stream from said secondary cooling zone, (h) supplying said removed gaseous stream from said secondary cooling zone to said primary cooling zone and (i) any additional cooling being through the repeating of steps (a) to (i); whereby all the gases are substantially maintained within the cooling zone apparatus.

7. A process for sintering sulfidic ore concentrates comprising sequentially providing a continuous moving strand of said concentrates to an ignition zone, a sintering zone, a primary cooling zone, a secondary cooling zone, and a final cooling zone; igniting said concentrates in said ignition zone; burning the sulfidic content of said concentrates in said sintering zone and cooling said strand in said primary, intermediate and final cooling zones; supplying first, second, third and fourth gas streams to said sintering, primary cooling, secondary cooling




and final cooling zones respectively; removing fifth, sixth, seventh and eighth gas streams from said sintering, primary, secondary and final cooling zones respectively; cooling said sixth gas stream to a temperature less than the temperature of said second gas stream; recirculating said cooled sixth gas stream to said third gas stream, recirculating said seventh gas stream to said second gas stream, and combining said eighth gas stream with said first gas stream.

17. A process for sintering a continuous moving strand of sulfidic ore concentrates comprising the sequential steps of:

(a) igniting said concentrates in an ignition zone;

(b) burning the sulfidic content of said concentrates in a sintering zone including supplying a first gas stream at a first predetermined temperature to said sintering zone;

(c) cooling strand in a primary cooling zone including supplying a second gas stream at a second predetermined temperature and removing said second gas stream from said primary cooling zone at a third predetermined temperature;

(d) further cooling said strand in a secondary cooling zone including supplying a third gas stream at a fourth predetermined temperature and removing said third gas stream from said secondary cooling zone at a fifth predetermined temperature;

(e) cooling said second gas stream after removal from said primary cooling zone from said third predetermined temperature to a temperature less than said second predetermined temperature;

(f) recirculating said second gas stream to said secondary cooling zone; and

(g) recirculating said third gas stream after removal from said secondary cooling zone to said primary cooling zone.

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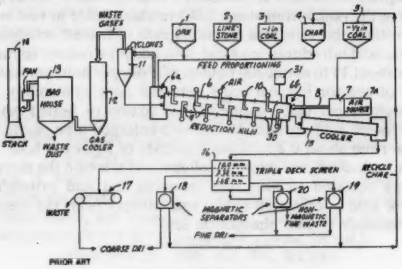
**4,337,084**

## SYSTEM FOR RECYCLING CHAR IN IRON OXIDE REDUCING KILNS

**Vitie P. Keran, and Alan C. Baker, both of Harriman, Tenn., assignors to The Direct Reduction Corporation, New York, N.Y.**

**Filed Mar. 24, 1980, Ser. No. 132,806**
**Int. Cl.³ C21B *13/08***
**U.S. Cl. 75—36** **11 Claims**




1. In the process for reducing materials containing iron oxides using a solid carbonaceous reducing agent as the source of reductant and fuel in a rotary kiln wherein part of said reducing agent is added from the discharge end and the remainder of said reducing agent is added at the feed end, and wherein the charred reducing agent is removed from the kiln discharge product and recycled, the improvement comprising the steps of:

returning the recycled charred reducing agent to the discharge end of the kiln; and

injecting said charred reducing agent into the kiln through the discharge end for deposition on the charge bed.

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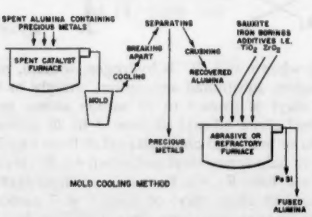
**4,337,085**

## RECOVERY OF PRECIOUS METALS FROM SPENT ALUMINA-CONTAINING CATALYSTS

**Paul Cichy, Buffalo, N.Y., assignor to Kennecott Corporation, Stamford, Conn.**

**Filed Sep. 30, 1980, Ser. No. 192,285**
**Int. Cl.³ C22B *11/00***
**U.S. Cl. 75—83 R** **16 Claims**




1. A method of recovering precious metal from spent alumina material comprising melting in a furnace spent alumina material containing precious metal, removing molten alumina from the top of the melted material, allowing the lower portion of the melt to cool and recovering concentrated precious metal from the lower cooled portion.

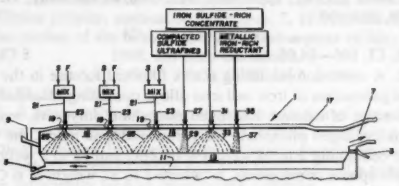
## 4,337,086
## METHOD FOR DECREASING METAL LOSSES IN NONFERROUS SMELTING OPERATIONS

**Paul E. Queneau, Cornish, N.H. 03746, and Reinhardt Schuhmann, Jr., 1206 Hayes St., West LaFayette, Ind. 47906**

**Continuation-in-part of Ser. No. 971,995, Dec. 21, 1978, Pat. No. 4,236,915. This application Oct. 16, 1980, Ser. No. 197,563**

**Int. Cl.³ C22B** *15/00, 23/02*

**U.S. Cl. 75—69** **27 Claims**




1. In a method for producing a metal matte from a nonferrous metal-containing sulfide mineral concentrate, of a particle size of less than about 65 mesh and containing particles of a size less than about 5 microns, in a horizontally disposed furnace wherein a molten charge of metal matte and a slag are present, beneath an enclosed hot atmosphere, and exhaust gases, metal matte and slag are separately discharged therefrom, the improvement where loss of nonferrous metals is averted, comprising:

(a) separating said nonferrous metal-containing sulfide mineral concentrate particles thereof having a size less than about 5 microns from the remainder of said sulfide concentrate;

(b) compacting said separated concentrate particles to form compacted concentrate for introduction into said furnace and onto said slag; and

(c) introducing the remainder of said sulfide concentrate, flux and an oxygen-rich gas into an enclosed hot sulfur dioxide-rich atmosphere so as to effect flash oxidation of the sulfide concentrates therein prior to contact of said concentrates with the molten slag, while injecting said compacted concentrate into the horizontal furnace and onto said slag at a location spaced from the slag discharge of the furnace.

## 4,337,087
## MICROCRYSTALLINE THIN STRIP FOR MAGNETIC MATERIAL HAVING HIGH PERMEABILITY, A METHOD OF PRODUCING THE SAME AND ARTICLES MADE FROM THE THIN STRIP

**Kiyoyuki Esashi, Higashiosaka, and Hisae Minatono, Minoo, both of Japan, assignors to Sumitomo Special Metals Co. Ltd., Osaka, Japan**

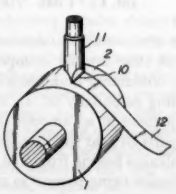
**PCT No. PCT/JP80/00100, § 371 Date Jan. 16, 1981, § 102(e) Date Jan. 9, 1981, PCT Pub. No. WO80/02620, PCT Pub. Date Nov. 27, 1980**

**PCT Filed May 10, 1980, Ser. No. 230,953**

**Claims priority, application Japan, May 16, 1979, 54/60714**

**Int. Cl.³ C22C** *38/06*

**U.S. Cl. 75—124** **7 Claims**




1. A microcrystalline thin strip for magnetic material having high permeability which consists of 7.0–9.6% of Si, 5.5–7.5% of Al, 0.3–3.0% of Mo, 0.3–4.0% of Ni and the remainder being substantially Fe has a tensile strength of more than 35 kg/mm² and a bending fracture strain of more than $8\times10^{-3}$.

## 4,337,088
## NON-MAGNETIC STABILIZER

**Edward L. Moses, Jr., 1775 Saint James Pl., Suite 170, Houston, Tex. 77056**

**Filed May 12, 1980, Ser. No. 149,290**

**Int. Cl.³ C22C** *38/22, 38/24, 38/38, 38/40*

**U.S. Cl. 75—128 A** **2 Claims**

1. A non-magnetic stabilizer for use in rotary rig drilling of boreholes with non-magnetic drill collars and having wear resistant and anti-galling characteristics, which comprises an elongated body having means for contacting the borehole to stabilize the body within the borehole, said body being manufactured of an alloy consisting of by weight:

| | |
|---|---|
| C | - .3/.06% |
| Mn | - .4.00/6.00% |
| P | - .04% |
| S | - .03% |
| Si | - 1.00% |
| Cr | - 20.50/23.50% |
| Ni | - 11.50/13.50% |
| Mo | - .50/3.00% |
| V | - .10/.30% |
| N | - .20/.40% |
| Cb | - .10/.30% |
| Fe | - balance |

## 4,337,089
## COPPER-NICKEL-TIN ALLOYS FOR LEAD CONDUCTOR MATERIALS FOR INTEGRATED CIRCUITS AND A METHOD FOR PRODUCING THE SAME

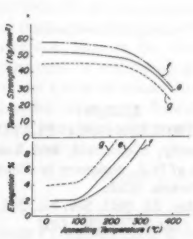
**Kishio Arita, Mito; Kiyoshi Murakawa, Tokyo, and Toshio Takahashi, Hachioji, all of Japan, assignors to Nippon Telegraph and Telephone Public Corporation; Nippon Bell Parts Co., Ltd., both of Tokyo and Nihon Telecommunication Engineering Corporation, Musashino, all of, Japan**

**Filed Dec. 29, 1980, Ser. No. 220,352**

**Claims priority, application Japan, Jul. 25, 1980, 55-101273**

**Int. Cl.³ C22C** *9/02, 9/06*

**U.S. Cl. 420—472** **2 Claims**




1. Copper-nickel-tin alloys for electrical lead conductor materials for integrated circuits containing 0.5–3.0% by weight of Ni, 0.3–0.9% by weight of Sn, 0.01–0.05% by weight of P and 0–0.35% by weight of at least one of Mn and Si and the remainder copper.

2. A method for producing copper-nickel-tin alloys for electrical lead conductor materials for integrated circuits comprising as sequential steps melting a starting material containing 0.5–3.0% by weight of Ni, 0.3–0.9% by weight of Sn, 0.01–0.05% by weight of phosphorus and 0–0.35% by weight

of at least one of Mn and Si and the remainder Cu; casting the molten metal; rolling the casting into a sheet having a thickness corresponding to more than 60% of cold reduction percent of the final necessary gauge; annealing said rolled sheet at a temperature of 300°-395° C. for 1 hour; cold rolling the annealed sheet; and annealing the cold rolled sheet at a temperature of 150°-250° 1 C. for 1 hour.

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**4,337,090**

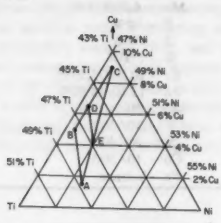
## HEAT RECOVERABLE NICKEL/TITANIUM ALLOY WITH IMPROVED STABILITY AND MACHINABILITY

**John D. Harrison, Palo Alto, Calif., assignor to Raychem Corporation, Menlo Park, Calif.**

**Filed Sep. 5, 1980, Ser. No. 184,602**

**Int. Cl.³ C22C *19/03***

**U.S. Cl. 148—402** **2 Claims**




1. A shape memory alloy consisting essentially of nickel, titanium and copper within an area defined on a nickel, titanium, and copper ternary phase diagram by a triangle with its first vertex at 49.7 atomic percent nickel, 48.8 atomic percent titanium, and 1.5 atomic percent copper; its second vertex at 47.5 atomic percent nickel, 47.5 atomic percent titanium, and 5.0 atomic percent copper; and its third vertex at 47.5 atomic percent nickel, 43.5 atomic percent titanium, and 9.0 atomic percent copper, said alloy possessing improved temper stability and machinability and having an $A_{50}$ between −50° C. and −196° C.

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**4,337,091**

## ELECTROLESS GOLD PLATING

**Mohamed F. El-Shazly, Bloomfield, and Kenneth D. Baker, Bridgewater, both of N.J., assignors to Hooker Chemicals & Plastics Corp., Warren, Mich.**

**Filed Mar. 23, 1981, Ser. No. 246,472**

**Int. Cl.³ C23C *3/02***

**U.S. Cl. 106—1.23** **22 Claims**

1. An aqueous electroless gold plating bath comprising a water-soluble, trivalent gold component selected from the group consisting of alkali metal auricyanides, alkali metal aurates and alkali metal aurihydroxides and a reducing agent selected from the group consisting of alkylamino boranes, alkali metal borohydrides and alkali metal cyanoborohydrides, the gold component being present in an amount at least sufficient to deposit gold on the substrate to be plated and the reducing agent being present in an amount at least sufficient to reduce the gold in the bath, which plating bath has a pH within the range of about 10 to 13.

**4,337,092**

## CORROSION-INHIBITING PIGMENT AND PAINT COMPOSITION

**Klaus Hestermann, Erftstadt; Alexander Maurer, Hürth-Knapsack; Joachim Kandler, Erftstadt; Gerhard Mietens, Hürth-Knapsack, and Herbert Beumling, Bergisch-Gladbach, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany**

**Filed Oct. 3, 1980, Ser. No. 193,550**

**Claims priority, application Fed. Rep. of Germany, Oct. 8, 1979, 2940695**

**Int. Cl.³ C09D *5/08***

**U.S. Cl. 106—14.05** **5 Claims**

1. A corrosion-inhibiting active pigment for use in the surface protection of iron and iron alloys consisting essentially of a mixture of calcium hydrogen phosphate dihydrate, magnesium hydrogen phosphate trihydrate and zinc oxide, the mixture containing 2 to 98 weight% of ZnO and 98 to 2 weight% of phosphate components, of which 3 to 97 weight% is $CaHPO_4.2H_2O$ and 97 to 3 weight% is $MgHPO_4.3H_2O$.

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**4,337,093**

## WOOD PRESERVING COMPOSITION AND METHOD OF USING SAME

**Wolfgang Metzner, Krefeld; Hubert Koddebusch, Moers-Vinn, both of Fed. Rep. of Germany, and Gerswid Poetter, deceased, late of Duesseldorf, Fed. Rep. of Germany (by Ursula Seeholzer, heiress), assignors to Deutsche Solvay Werke GmbH, Solingen, Fed. Rep. of Germany**

**Filed Jul. 3, 1980, Ser. No. 165,791**

**Claims priority, application Fed. Rep. of Germany, Jul. 6, 1979, 2927349**

**Int. Cl.³ C09D *5/14***

**U.S. Cl. 106—18.33** **18 Claims**

1. A composition for preserving wood and construction materials of wood, said composition comprising:

at least about 65% by weight of a difficultly volatile organic-chemical solvent having a flash point higher than about 30° C.; and

between about 0.35% by weight and about 10% by weight, of a fungicidal agent which is at least partly soluble in said organic-chemical solvent, said fungicidal agent comprising a mixture of N,N-dimethyl-N'-phenyl-N'-(fluoro dichloro methylthio) sulfamide and N,N-dimethyl-N'-(-p-tolyl)-N'-(fluoro dichloro methylthio) sulfamide in the relative proportion, by weight, of between about 25:10 and about 10:30.

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**4,337,094**

## ADDITIVE COMPOSITION FOR PORTLAND CEMENT MATERIALS

**Valery Tokar, University Heights, Ohio, assignor to The Euclid Chemical Company, Cleveland, Ohio**

**Filed May 11, 1981, Ser. No. 262,488**

**Int. Cl.³ C04b *7/06***

**U.S. Cl. 106—90** **10 Claims**

1. An additive composition to decrease the normal setting time and increase the normal compressive strength of a portland cement containing composition such as mortar and concrete, consisting essentially of, an aqueous solution of (i) calcium nitrate present in an amount of at least 30 parts by weight per 100 parts of said solution, and (ii) a polyalkanolamine of a lower alkanol having from 2 to about 5 carbon atoms, said polyalkanolamine being present in an amount in the range from about 0.05 parts to about 5 parts per 100 parts by weight of said solution, said solution being stable in storage in the temperature range from about 32° F. to about 140° F.

4,337,095

## PROCESS FOR THE PREPARATION OF SOLUTIONS OF CELLULOSE DERIVATIVES IN ORGANIC SOLVENTS HAVING HIGHER CONCENTRATION AND SOLUTIONS OBTAINED BY SAID PROCESS

Roberto Leoni, Milan; Alberto Baldini, Garlasco; Angelo Calloni, and Gianfranco Angelini, both of Buscate, all of Italy, assignors to SNIA Viscosa S.p.A. - Societa' Nazionale Industria Applicazioni Viscosa, Milan, Italy

Filed May 30, 1980, Ser. No. 155,113

Claims priority, application Italy, Jun. 7, 1979, 23350 A/79

The portion of the term of this patent subsequent to May 19, 1998, has been disclaimed.

Int. Cl.[3] C08B *16/00*; C08L *1/02, 1/08*

U.S. Cl. 106—203 9 Claims

1. A process for the preparation of a solution of a methylol derivative of cellulose in an organic solvent, comprising contacting cellulose having a polymerization degree lower than 300 with paraformaldehyde and with the solvent at a temperature sufficiently high to dissolve the cellulose.

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4,337,096

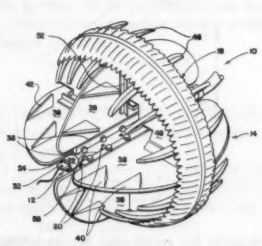
## METHOD AND IMPLEMENT FOR CLEANING DRAINS

Jack R. Clifford, Alton, Ill., assignor to Paul L. Pratt, Bethalto and John T. Pierce, Jr., Edwardsville, both of, Ill., part interest to each

Continuation-in-part of Ser. No. 168,727, Jul. 14, 1980, Pat. No. 4,326,893, which is a continuation-in-part of Ser. No. 42,548, May 25, 1979, Pat. No. 4,218,803. This application Nov. 10, 1980, Ser. No. 205,645

Int. Cl.[3] B08B *9/04*

U.S. Cl. 134—8 10 Claims



1. An implement for cleaning drains, said implement comprising a carriage hub for attachment of cutting and plunging means, said cutting means comprising a plurality of blades radially extending from the carriage hub, said plunging means comprising a plurality of elements pivoted between said blades and prevented from folding flat against said blades so that said elements are folded backward at an inclined angle to said blades when the implement is pulled through a drain in a direction parallel to the hub whereby said inclined elements are arranged to torque the implement and which are folded forwardly to form a plate when the implement is pulled in an opposite direction, said implement further including water directing means for spraying water in advance of the cutting means.

9. A method for cleaning tubular drains filled with debris which comprises towing an implement comprising a carriage hub with cutting, plunging and scraping means, said cutting means comprising a plurality of blades radially extending from the carriage hub, said blades being circular segments and mounted on said carriage hub such that said implement is spherical in shape, said plunging means comprising a plurality of elements pivoted between said blades and prevented from folding flat against said blades so that said elements are folded backwardly at an inclined angle to said blades when the implement is pulled forward through a drain in a direction parallel to the axis of the carriage hub whereby said inclined elements torque the implement, said pulling being in a forward direction and for a selected distance, said implement further including water directing means for spraying water in front of the cutting means whereby the waste in the drain is wetted by water from the water directing means, churned loose by the cutting means and passed around the plunging means torquing the implement; said method further including towing the implement in an opposite direction after the preselected distance has been reached, as said implement is towed backwardly, the loosened waste material in the drain exerting pressure on one or more of said pivoted elements comprising the plunging means and inclined at an angle to said blades causing them to reverse the fold into a plate having substantially the same diameter as the drain, whereby the waste churned loose by the cutting means and passed around the plunging means is swept backward by the fully expanded plunging means as the implement is towed backwards.

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4,337,097

## METHOD FOR MAKING A SELECTIVE ABSORPTION FILM FOR SOLAR ENERGY

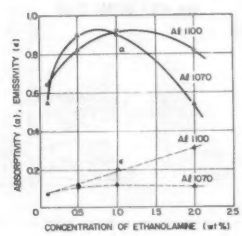
Hiroyuki Tokumasu, Hirakata; Hideo Uchino, Higashi-Osaka, and Shiro Hozumi, Sakai, all of Japan, assignors to Matsushita Electric Industrial Company, Limited, Osaka, Japan

Filed Dec. 23, 1980, Ser. No. 219,427

Claims priority, application Japan, Dec. 28, 1979, 54-171151; Dec. 28, 1979, 54-171152

Int. Cl.[3] C23F *7/06, 7/14*

U.S. Cl. 148—6.15 R 10 Claims




1. A method for the production of a selective absorption film for solar energy which comprises immersing aluminium or its alloy in water solution which consists essentially of at least two members selected from the group consisting of phosphate ions, fluoride ions and triethanolamine for a sufficient time to form a chemical conversion film on the aluninium or its alloy, wherein said immersion is conducted at a temperature not lower than 80° C. for a time of at least 10 minutes, the concentration of the phosphate ions or the fluoride ions is in the range of 20–300 ppm, and the concentration of triethanolamine is in the range of 0.2–2 wt%.

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4,337,098

## PROCESS FOR CUTTING OUT A WALL MADE OF METAL OR METAL ALLOY

Jean Chavand, Grenoble; Maurice Daguenet, Veurey, and Rene Gillet, Grenoble, all of France, assignors to Commissarint a l'Energie Atomique, Paris, France

Filed Jan. 16, 1981, Ser. No. 225,666

Claims priority, application France, Jan. 28, 1980, 80 01771

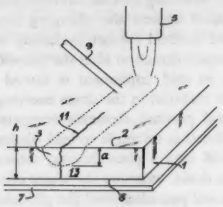
Int. Cl.[3] B23K *7/08*

U.S. Cl. 148—9 R 7 Claims

1. A process for cutting out a wall made of metal or metal alloy by fissuring, comprising the steps of:

heating one face of the wall to melt the metal locally over a depth limited to a fraction of the thickness of the wall,

adding in the molten zone a material having a fissuring power,



moving the heating means along the section to be cut out, whilst continuing to add the metal having a fissuring power in the molten zone.

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**4,337,099**

## METHOD AND APPARATUS FOR CONDITIONING OF STEEL SURFACE

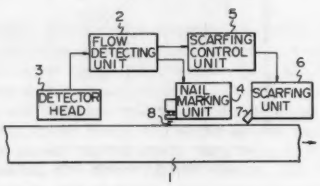
**Tatsuo Hiroshima, Nishinomiya, and Takahide Sakamoto, Minoo, both of Japan, assignors to Sumitomo Metal Industries, Ltd., Osaka, Japan**

**PCT No. PCT/JP79/00157, § 371 Date Apr. 10, 1980, § 102(e) Date Apr. 10, 1980, PCT Pub. No. WO80/02812, PCT Pub. Date Dec. 24, 1980**

**PCT Filed Jun. 20, 1979, Ser. No. 262,067**

**Int. Cl.³ B23K *7/08***

**U.S. Cl. 148—9.5** **4 Claims**




1. A method for conditioning of surface flaws of steel, comprising the steps of:

detecting a surface flaw in a red-hot steel material;

driving into said flaw steel nails in a number corresponding to the size of said flaw; and

performing scarfing conditioning of said flaw starting from the nails.

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**4,337,100**

## MAGNETICALLY ANISOTROPIC ALLOYS FOR MAGNETICALLY ACTUATED DEVICES

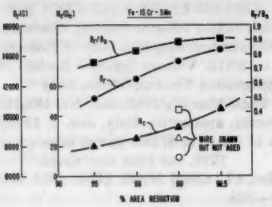
**Sungho Jin, Gillette, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.**

**Filed Oct. 6, 1980, Ser. No. 194,252**

**Int. Cl.³ C04B *35/00***

**U.S. Cl. 148—31.55** **8 Claims**

1. Anisotropic magnetic alloy comprising an amount of at least 99 weight percent Fe, Cr, and Mo, Cr being in the range of 6-26 weight percent of said amount and Mo being in the range of 1–12 weight percent of said amount, said alloy comprising elements Ni, Mn, Si, Al, Cu, V, Ti, Nb, Zr, Ta, Hf, and W in individual amounts of less than 0.2 weight percent of said alloy and less than 0.5 weight percent of said alloy in combination, said alloy comprising elements C, N, S, P, B, H, and O in individual amounts of less than 0.1 weight percent of said alloy and less than 0.5 weight percent of said alloy in combination, said alloy having magnetic squareness ratio greater than or



equal to 0.85, and said alloy having remanence greater than or equal to 12000 gauss.

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**4,337,101**

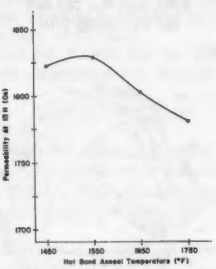
## PROCESSING FOR CUBE-ON-EDGE ORIENTED SILICON STEEL

**Frank A. Malagari, Jr., Freeport, Pa., assignor to Allegheny Ludlum Steel Corporation, Pittsburgh, Pa.**

**Filed Aug. 18, 1980, Ser. No. 179,405**

**Int. Cl.³ H01F *1/04***

**U.S. Cl. 148—111** **5 Claims**




1. In a process for producing boron-inhibited electromagnetic silicon steel having a cube-on-edge orientation and a permeability of at least 1800 ($G/O_e$) at 10 oersteds, which process comprises the steps of preparing a melt of silicon steel containing from 0.02% to 0.06% carbon, from 0.0006% to 0.008% boron, up to 0.01% nitrogen, no more than 0.008% aluminum and from 2.5% to 4.0% silicon, casting the steel, soaking the steel, hot rolling the steel to hot band thickness, annealing the hot band, cold rolling the annealed steel, decarburizing the cold rolled steel, applying a refractory oxide base coating to the decarburized steel, and final textue annealing the base coated steel, wherein the improvement comprises the steps of annealing the hot band at a thickness of about 0.10 inch in a temperature range of from about 1450° F. to about 1650° F. and then cold rolling the steel to a final thickness of about 0.018 inch in one cold reduction.

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**4,337,102**

## HIGH ENERGY SOLID PROPELLANT COMPOSITION

**Adolf E. Oberth, Fair Oaks, and Howard A. Price, Folsom, both of Calif., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.**

**Filed Feb. 4, 1980, Ser. No. 118,008**

**Int. Cl.³ C06B *45/10***

**U.S. Cl. 149—19.3** **6 Claims**

1. In a high energy solid propellant composition consisting essentially of:

a. a solid poly (ethylene oxide) diol, binder;

b. an inorganic oxidizer; and

c. a high energy plasticizer, the improvement wherein a minor amount of a soluble perchlorate salt selected from the group consisting of lithium perchlorate and magnesium perchlorate is present in a dissolved state in said binder as a mechanical behavior improving additive.

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4,337,103

## COMPOSITE PROPELLANT WITH DIFFERENTIALLY CURED AREA AT INITIAL BURN SURFACE

**Donald E. Elrick, Rawlings, and Harry Gilbert, Cumberland, both of Md., assignors to Hercules Incorporated, Wilmington, Del.**

**Continuation-in-part of Ser. No. 667,623, Sep. 6, 1967, Pat. No. 3,948,698. This application Dec. 4, 1968, Ser. No. 781,282**

**Int. Cl.³ C06B *45/10***

**U.S. Cl. 149—19.9** **5 Claims**

1. A process for the manufacture of a cured, rubber base composite rocket propellant having a lower cross-link density at and adjacent at least a portion of its initial burning surface than throughout the remainder of the propellant, which process comprises (a) partially curing in its entirety an uncured composite propellant composition comprising solid oxidizer and a binder system containing a carboxy terminated rubber, hydroxy terminated rubber, mercapto terminated rubber or amine terminated rubber and a curing agent therefor until sufficient cross-linking has occurred to provide a predetermined strain capability at the initial burning surface; (b) applying to at least a portion of said initial burning surface sufficient of a monofunctional interferrent material reactive with said binder system to prevent further curing from occurring at said surface; and (c) then completing the cure of said propellant composition whereby the cross-link density and strength of the remaining curable portion of the propellant has increased.

5. The cured rubber base composite rocket propellant produced by the process of claim 1.

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4,337,104

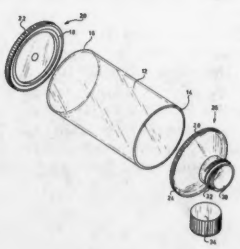
## METHOD FOR MANUFACTURING A ROLLER BOTTLE

**Robert W. Lynn, Oxnard, Calif., assignor to Becton, Dickinson and Company, Paramus, N.J.**

**Continuation of Ser. No. 123,981, Feb. 25, 1980, abandoned, which is a division of Ser. No. 949,450, Oct. 10, 1978, Pat. No. 4,238,568. This application Feb. 9, 1981, Ser. No. 232,619**

**Int. Cl.³ B29C *27/02***

**U.S. Cl. 156—69** **5 Claims**



1. A method for manufacturing a roller bottle having a treated interior surface capable of allowing cell adhesion thereto comprising the steps of:

providing a substantially cylindrical center portion having an open first end, an open second end, and interior and exterior surfaces;

tissue culture treating the interior surface of the center portion;

permanently attaching a first end cap having a serrated circumferential surface around its peripheral edge to the first end of the center portion;

permanently attaching a second end cap having a serrated circumferential surface around its peripheral edge to the second end of the center portion, said serrated surfaces protruding from the exterior surface of said center portion, said serrated circumferential surfaces of the end caps having gear-shaped serrations adapted to mesh with similar serrations on end caps of similar roller bottles to thereby facilitate traction when such roller bottles are rotated; and wherein the step of permanently attaching the first and second end caps is performed by one of either ultrasonic welding, gluing or spin welding.

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4,337,105

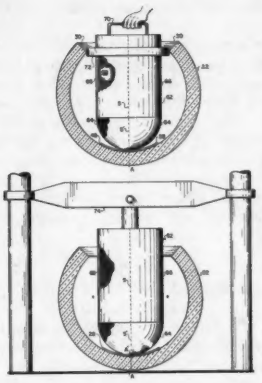
## SPHERICAL SEGMENT INNER SURFACE FORCE APPLICATOR FOR LAMINATING NON-PLANAR SURFACES

**Jerry D. Stachiw, El Cajon, and Donald L. Endicott, Jr., San Diego, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.**

**Filed Sep. 4, 1980, Ser. No. 183,913**

**Int. Cl.³ B29C *17/06*; B30B *5/02*; B32B *1/00, 1/06, 1/10***

**U.S. Cl. 156—87** **11 Claims**



1. A method for bonding selected compliant material to a portion of the inner surface of a rigid spherical segment, said method comprising the steps of:

spreading a quantity of initially uncured adhesive material over said portion of said inner surface;

placing said compliant material in contact with said adhesive material;

initially positioning an elastomeric spherical segment so that the apex of said segment contacts a point on said compliant material, said elastomeric segment being initially in an undeformed condition, the radius of curvature of said elastomeric segment being less than the radius of curvature of said inner surface of said rigid spherical segment when said elastomeric segment is in an undeformed condition; and

urging said elastomeric segment toward said compliant material so that all points on the external surface of said elastomeric segment which are initially at the same distance from said specified point are brought into contact with said compliant material at the same time.

4. An apparatus for applying force to selected compliant material which is in adjacent relationship with the inner surface of a rigid spherical segment comprising:

an elastomeric means for selectively coupling compressive force to said compliant material, said elastomeric means having an apex and a radius of curvature which is less than the radius of curvature of said inner surface when said elastomeric means is in an undeformed condition and

operative means for initially spacing said elastomeric means from said rigid spherical segment so that said apex is in point contact relationship with said compliant material, and for controllaby urging said elastomeric means toward said compliant material, after said initial spacing, until the curvature of said elastomeric means is conformed to the curvature of said inner surface and said compliant material is selectively compressed between said rigid inner surface and said conformed elastomeric means, said operative means comprises means for manipulating said elastomeric means to initially apply a compressive force to said compliant material at said point of contact between said apex and said compliant material, and to thereafter apply compressive force to each point of said compliant material which lies within a compressive force zone which expands outwardly through said compliant material from said contact point, said compressive force zone reaching a given point of said compliant material before reaching any other point of said compliant material which is at a farther distance from said contact point than said given point, said compliant material includes a layer of selected viscous material selectively spread across said inner surface of said rigid spherical segment, and wherein said operative means comprises:

a shaft means, said elastomeric means being joined to an end of said shaft;

means for initially orienting said shaft means so that said elastomeric means is suspended above said viscous material in said initial spacing relationship, and for releasing said shaft means after said initial orientation; and

particulate weighting material contained within said elastomeric means for responding to gravitational force to initially apply said compressive force to said contact point, and to apply compressive force to each point of said viscous material which lies within said compressive force zone after said shaft has been released.

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**4,337,106**

## METHOD OF MAKING AIR CUSHION VEHICLE FLEXIBLE SKIRTS

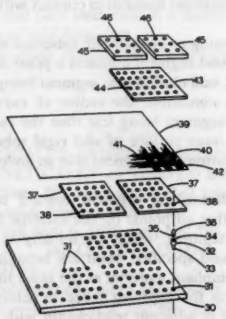
**Raymond L. Wheeler, Cowes, England, assignor to British Hovercraft Corporation Ltd., Yeovil, England**

**Division of Ser. No. 50,609, Jun. 21, 1979, Pat. No. 4,248,320, which is a continuation-in-part of Ser. No. 840,860, Oct. 11, 1977, abandoned. This application Jul. 24, 1980, Ser. No. 171,725**

**Claims priority, application United Kingdom, Oct. 31, 1976, 42628/76**

**Int. Cl.³ B32B *31/18, 31/04***

**U.S. Cl. 156—228** **3 Claims**




1. A method of manufacturing an apertured flexible sheet component for an air cushion vehicle flexible skirt, comprising locating a first sheet of elastomeric material having a plurality of shaped apertures therein on a face of a flat plate from which projects a plurality of peg members corresponding in shape and position to the apertures in the sheet and so that the peg members extend through said sheet apertures; locating on the sheet of elastomeric material a layer of reinforcing fabric having substantial spacings between groups of warp and weft cords so that said peg members pass through the spacings between the warp and weft cords in said reinforcing fabric; locating on said reinforcing fabric a second sheet of elastomeric material having a plurality of shaped apertures corresponding with those in said first sheet and so that said peg members pass through the apertures in the second sheet; locating an apertured pressure plate over the projecting ends of said peg members; subjecting the resulting assembly to pressure and heat to effect curing of the elastomeric material; and removing the pressure plate and the flat plate with the pegs whereby the removal at the pegs provides apertures of the desired size and shape in the flexible skirt without damaging the warp and weft cords of the reinforcing fabric.

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**4,337,107**

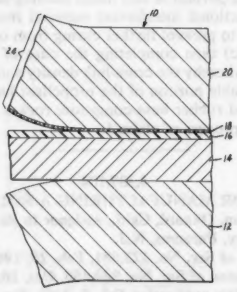
## ABRASION-RESISTANT TRANSFER LAMINATING SHEET MATERIAL

**Ronald J. Eshleman, Stillwater, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.**

**Filed Jun. 16, 1980, Ser. No. 160,136**

**Int. Cl.³ A61F *13/02*; B29B *31/00*; B32B *31/00*; C61F *13/02***

**U.S. Cl. 156—249** **14 Claims**

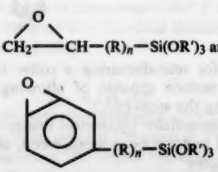



1. A multilayered sheet of material for providing a transferrable abrasion-resistant coating capable of lamination comprising in sequence

a. a strippable carrier substrate;

b. a flexible abrasion-resistant coating on the said carrier substrate wherein said coating is from 1.27 to 25.4 μm thick and comprises a polymer which has at most 30% haze according to ASTM D 968-51 using 1 liter of sand in 10–11 seconds, said polymer having

(1) 25 to 60% by weight units derived from precondensed monomers which are epoxy-terminated silanes of the formulae




wherein R is selected from alkylene of 1 to 10 carbon atoms and $—CH_2—O—(CH_2)_m—$, wherein m is 1 to 5, n is 1, and R′ is selected from alkyl of 1 to 8 carbon atoms,

(2) 40 to 75% by weight units derived from epoxidized organic compounds other than epoxy silanes, and

(3) from 0.1 to 5% by weight of an antioxidant;

c. a coated pressure-sensitive adhesive layer which is from 0.5 to 13 μm thick; and

d. a strippable release sheet comprised of a liner substrate with a low adhesion backsize;

wherein

the release force between the abrasion-resistant coating, peeled at a 180° angle, and the carrier substrate is <25 g/2.54 cm width, and

the release force between the release sheet, peeled at a 180° angle, and the pressure-sensitive adhesive coating is <10 g/2.54 cm width.

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**4,337,108**

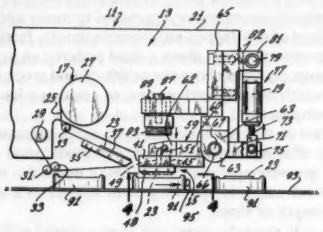
## LABEL APPLICATOR WITH OSCILLATING LABEL RECEIVER AND METHOD

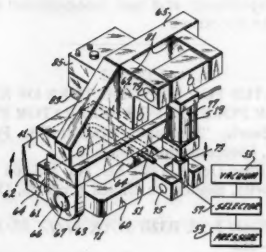
**Michael Crankshaw, Santa Fe Springs, and Leo Kucheck, Irvine, both of Calif., assignors to Label-Aire Inc., Fullerton, Calif.**

**Filed Oct. 29, 1980, Ser. No. 199,181**

**Int. Cl.³ B32B *31/00*; B65H *25/00*; B44C *1/00*; B65H *17/36*; B65C *1/02***

**U.S. Cl. 156—285** **12 Claims**





1. A label applicator comprising:

a supporting structure;

a label receiver;

means for mounting said label receiver on the supporting structure for movement in both directions about a pivot axis between a retracted position and an extended position;

label dispensing means for supplying at least one label to the label receiver when the label receiver is in said retracted position;

said label receiver including means for releasably retaining the label supplied to the label receiver by the label dispensing means;

means for moving said label receiver in both directions about said pivot axis between said retracted position and said extended position; and

passage means in said label receiver for transmitting a blast of gas to the label on the label receiver at least when the label receiver is in the extended position to transfer the label on the label receiver to an article.

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**4,337,109**

## PROCESS OF PREPARING AN ORNAMENT FOR TOMBSTONES OR THE LIKE

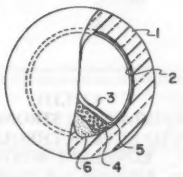
**Kinjo Narita, No. 292, Ooaza Wattokumachi Hirosaki-shi, Aomori-ken, Japan**

**Division of Ser. No. 46,506, Jun. 7, 1979, Pat. No. 4,259,381. This application Oct. 21, 1980, Ser. No. 199,313**

**Claims priority, application Japan, Jun. 8, 1978, 53-69215**

**Int. Cl.³ E04H *13/00***

**U.S. Cl. 156—293** **3 Claims**



1. A process of preparing an ornamental element adapted to be fixed to a monument which comprises:

providing a transparent body having a convex lense shape in the front side portion thereof, said body having a recess provided in the back side portion for receiving a desired document, said recess having a margin projecting inwardly such that the diameter of the marginal surface is smaller than the diameter of the inside portion of said recess;

introducing a powder-type desiccant material into said recess so as to cover the document;

applying a water-proof paper over said desiccant; and

introducing a sealer material into the remaining portion of the recess adjacent to said waterproof paper overlying the desiccant for sealing and protecting the document from the environment.

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**4,337,110**

## LAMINATES PREPARED FROM SOLUTIONS OF RESINS CONTAINING AMIC ACID GROUPS

**Patricia A. Antonoplos, and William J. Heilman, both of Houston, Tex., assignors to Gulf Oil Corporation, Pittsburgh, Pa.**

**Division of Ser. No. 794,902, May 9, 1977, Pat. No. 4,133,792. This application Apr. 27, 1978, Ser. No. 900,671**

**Int. Cl.³ C09J *5/02***

**U.S. Cl. 156—307.4** **2 Claims**

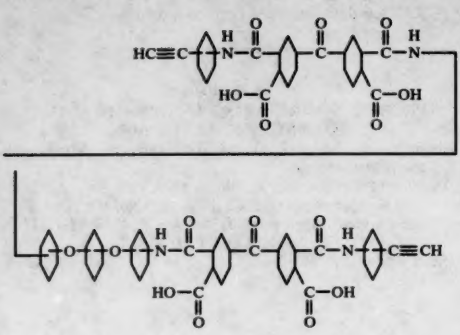
1. A method for preparing a cured resin impregnated glass fabric laminate which consists essentially of:

a. impregnating a glass fabric with a solution of a heat curable resin containing amic acid groups,

b. heating the impregnated glass fabric of step (a) to an elevated temperature to remove the solvent therefrom and to convert the amic acid groups of the resin solids to imide groups, and

c. assembling a plurality of impregnated glass fabrics from step (b) and heating said assembly under pressure to a temperature in the range of about 177°–260° C.,

the resin solution of step (a) consisting essentially of at least 30 weight % of heat curable resin solids dissolved in a solvent selected from the group consisting of N-methyl-2-pyrrolidone, cyclohexanone, diethyl carbonate, and gamma-butyrolactone, said heat curable resin solids consisting predominantly of a chemical compound having the structure:



4,337,111

## METHOD OF OBTAINING STRONG AND DURABLE ADHESION TO RUBBER THROUGH CHEMICAL COVALENT BONDS

Karl C. Kauffman, Ridgecrest, and Martin H. Kaufman, China Lake, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 2, 1978, Ser. No. 947,971
Int. Cl.³ C09J 5/02
U.S. Cl. 156—307.5 8 Claims

1. A method for introducing covalent bonds between vulcanized rubber and an adhesive comprising the steps of:

coating a surface of unvulcanized or partially vulcanized rubber with a coating polymer capable of co-vulcanizing with the rubber and having functional groups capable of reacting with said adhesive;

co-vulcanizing the rubber and coating polymer and

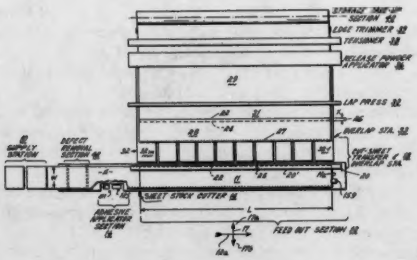
applying said adhesive to the coated surface whereby said adhesive reacts with said functional groups.

4,337,112

## APPARATUS FOR MAKING AN INDEFINITE LENGTH COMPOSITE SHEET OF VERY LARGE PREDETERMINED WIDTH FROM INDEFINITE LENGTH SHEET STOCK RELATIVELY SMALL WIDTH

Jack L. Hollis, Mechanicsburg, Pa., assignor to Carlisle Tire & Rubber Co., Carlisle, Pa.

Continuation-in-part of Ser. No. 20,133, Mar. 13, 1979, abandoned. This application Apr. 16, 1980, Ser. No. 140,815
Int. Cl.³ B32B 31/18
U.S. Cl. 156—351 39 Claims



1. Apparatus for manufacturing composite sheet of predetermined width and indefinite length from stock sheet of known width and indefinite length, which includes:

(a) feed-out means to feed out along a first path in a first horizontal direction a predetermined length of said stock sheet from a supply thereof, said first path being in nonoverlapping position to said composite sheet and spaced therefrom in a direction parallel to the length of said composite sheet,

(b) means to cut said stock sheet, while horizontally disposed along said first path in said first direction, to said predetermined length, said predetermined length being a substantial multiple of said known width of said stock and at least equal to said predetermined selective width of said composite sheet,

(c) transfer means to move only said cut length of sheet, subsequent to feed-out thereof by said feed-out means from said fully fed-out position along said first path and prior to cutting a successive predetermined length sheet, a predetermined distance along a second path in a second horizontal direction which is transverse to said first horizontal direction of feeding of said stock sheet, to an overlap station whereat the cut length of sheet overlaps and forms a lap joint with a prior cut length of sheet along an overlap edge zone thereof to form a composite sheet, said predetermined distance at least exceeding said known width of said indefinite length stock sheet, said overlap station being transversely horizontally displaced from said first path a distance equal to said predetermined distance,

(d) composite sheet conveying means to move said composite sheet of overlapped cut sheets in unison, further in said transverse direction along a third path, by an incremental distance equal to about the width of said stock sheet less the width of said overlap zone, to position a lap joint at a pressing station,

(e) means at said pressing station to apply pressure to a lap joint of said composite sheet to provide good adhesion, said pressure-applying means being operative while said feed-out means is operating with respect to a successive cut length of sheet,

(f) means to store the composite sheet material with different portions thereof in contact with each other, and

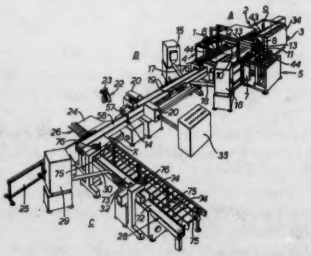
(g) said feed-out means, transfer means, and conveying means being operative along said first, second, and third paths, respectively, and each being distinct and separate relative to the others.

4,337,113

## APPARATUS FOR MANUFACTURE OF SLEEVES AND/OR POCKETS FOR SEPARATOR PLATES

Clifford A. Searle, "Kynance", Moffatt Rd., Forest Green, Nailsworth, Gloucestershire, England

Filed Oct. 8, 1980, Ser. No. 195,306
Claims priority, application United Kingdom, Oct. 19, 1979, 7936395
Int. Cl.³ B26D 5/38; B32B 31/08, 31/12, 31/18, 31/20
U.S. Cl. 156—353 10 Claims



1. Apparatus for use in the manufacture of a separator sleeve or pocket, comprising an assembly table or the like providing a region for the assembly of a separator/plate sandwich, means

for feeding the separator/plate sandwich from the table to a linear conveyor for conveying the sandwich through a sealing region past an array comprising extruder means to extrude a ribbon of plastics material into a side edge gap of the sandwich, and means for cutting off excess extruded material beyond the ends of the separators while travelling along the conveyor.

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4,337,114

## NODULAR COPPER REMOVAL FROM ALUMINUM FOIL SURFACES

Philip G. Russell; Walter J. Bernard, and Sidney D. Ross, all of Williamstown, Mass., assignors to Sprague Electric Company, North Adams, Mass.

Filed Oct. 29, 1980, Ser. No. 202,027
Int. Cl.³ B44C 1/22
U.S. Cl. 156—656 6 Claims

1. A process for removing nodular copper from the surface of etched aluminum foil comprises contacting said foil bearing a thin uniform copper layer and nodular copper with a 0.1 to 2.0 M ammonium persulfate solution to selectively dissolve said nodular copper and leave said uniform layer.

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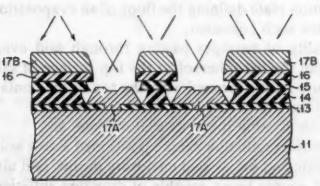
4,337,115

## METHOD OF FORMING ELECTRODES ON THE SURFACE OF A SEMICONDUCTOR SUBSTRATE

Masashi Ikeda, and Shintaro Ito, both of Yokohama, Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Japan

Division of Ser. No. 959,219, Nov. 9, 1978, abandoned, which is a continuation-in-part of Ser. No. 802,867, Jun. 2, 1977, abandoned. This application Apr. 4, 1980, Ser. No. 137,813
Claims priority, application Japan, Jun. 2, 1976, 51-63561
Int. Cl.³ H01L 21/306; C23F 1/02; B05D 5/12
U.S. Cl. 156—659.1 8 Claims




1. A method of forming an electrode on the surface of a semiconductor substrate which comprises the steps of:

(A) depositing on the surface of a semiconductor substrate an insulation layer provided with at least one opening for contact between the electrode and the semiconductor substrate;

(B) coating a plurality of spacer layers made of insulation material on the surface of the insulation layer inclusive of the contact opening;

(C) selectively depositing a photoresist layer on the uppermost one of said plural spacer layers, said uppermost spacer layer in direct contact with the photoresist layers being designed to be etched at a lower rate than the immediately underlying spacer layer;

(D) using the photoresist layer as a mask to selectively etch the spacer layers until the opening of the insulation layer is exposed;

(E) depositing a metal layer on the surface of the semiconductor substrate through the opening of the insulation layer and on the surface of the photoresist layer; and

(F) removing the photoresist layer and the portions of the metal layer formed thereon, such that that portion of the metal layer which is deposited on the surface of the semiconductor substrate exposed through the contact opening constitutes the electrode and the spacer layers remaining on the insulation layer form protective layers for the surface of the semiconductor substrate.

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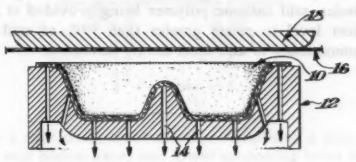
4,337,116

## CONTOURED MOLDED PULP CONTAINER WITH POLYESTER LINER

Peter D. Foster, Waterville, and Clifford Stowers, Fairfield, both of Me., assignors to Keyes Fibre Company, Waterville, Me.

Continuation of Ser. No. 70,392, Aug. 28, 1979, abandoned. This application Jan. 26, 1981, Ser. No. 228,876
Int. Cl.³ D21J 3/00
U.S. Cl. 162—158 17 Claims




1. A process for directly bonding a substantially impervious polyester liner to a contoured molded pulp base which comprises the steps of (1) pre-heating a pre-formed base which has been obtained by molding fibrous pulp from an aqueous slurry thereof against an open-face suction mold to substantially finished contoured shape which includes horizontal and sloping but no substantially vertical wall portions, (2) pre-heating a film of polyester and (3) then pressing the pre-heated film into contact with at least one contoured portion of at least one surface of the pre-heated base so that the film is stretched into direct contact with the contoured base and becomes directly bonded to the base to form a contiguous and integral liner thereon, the improvement being that the polyester film is (a) substantially amorphous, substantially unoriented polyethylene terephthalate and it (b) is pre-heated to a thermoforming temperature within the range in which it will substantially crystallize in time but then (c) is rapidly pressed into contact with and bonded to the base while it is still substantially amorphous and before enough time has passed in that temperature range to crystallize it to the stage at which it will not directly bond to the base, whereby (d) after the lined product is cooled to room temperature the liner will not shrink-separate away from the contoured base as a result of subsequent exposure to a temperature of about 400° F.

2. A process as in claim 1 wherein the film has a thickness of less than about 2.0 mil, and it is pre-heated to a thermoforming temperature within the range of from about 250° F. to about 400° F. but then is rapidly pressed into contact with and bonded to the base before the film has been at that thermoforming temperature for longer than about 2 seconds.

10. A plastic-lined molded pulp product which is three-dimensionally contoured with horizontal and sloping but no substantially vertical wall portions to permit like products to be nested one within another in a stack of such products, the product comprising a pre-formed base obtained by molding fibrous pulp from an aqueous slurry thereof against an open-face suction mold to substantially finished contoured shape, and a substantially impervious liner directly bonded to at least one contoured portion of at least one surface of the molded pulp base, the liner consisting essentially of polyethylene terephthalate obtained from a substantially amorphous and substantially unoriented film thereof which will not shrink-separate away from the contoured base as a result of exposure to a temperature of about 400° F.

## 4,337,117
## DECAY RESISTANT MATERIAL

**Warren J. Bodendorf, Montgomery, and Alphonse R. Presto, Holyoke, both of Mass., assignors to Texon Inc., South Hadley, Mass.**

**Filed Aug. 13, 1980, Ser. No. 177,779**
**Int. Cl.³ D21H *5/22***
**U.S. Cl. 162—161** **5 Claims**

1. A process for manufacturing a wet laid synthetic fibrous sheet material which is resistant to decay by microbial organisms according to a papermaking technique including:

providing a furnish of a fibrous slurry 5 to 12 parts by weight to 100 parts by weight of fiber metal-quinolinolate emulsion, a cationic polymer, and a polymer colloid;

forming said furnish into a web;

saturating said web with a binder; and

drying said web to form a fibrous sheet with fibers and metal-quinolinolate uniformly distributed throughout said binder, said cationic polymer being provided at a sufficient level to retain greater than 99% of said metal-quinolinolate in said sheet during formation.

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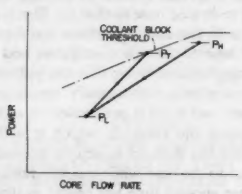
## 4,337,118
## NUCLEAR REACTOR POWER MONITORING SYSTEM

**Mikio Sakurai, Mito; Yuichiro Yoshimoto, and Hiroshi Kodama, both of Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Filed Oct. 12, 1979, Ser. No. 84,437**
**Claims priority, application Japan, Oct. 16, 1978, 53-126196**
**Int. Cl.³ G21C *7/00***
**U.S. Cl. 376—210** **6 Claims**




1. In a nuclear reactor having a core including means for recirculating a coolant through the core to make a core coolant flow, means associated with said recirculating means for controlling the core coolant flow rate, means for detecting the power level of the reactor and producing a signal indicative of the detected power level, and means for detecting the core coolant flow rate and producing a signal indicative of the detected flow rate, the combination of:

(a) means responsive to the signal from said flow rate detecting means for producing a signal indicative of the maximum threshold power level at the detected flow rate, the threshold being previously determined and inputted to said means as a function of the core coolant flow rate;

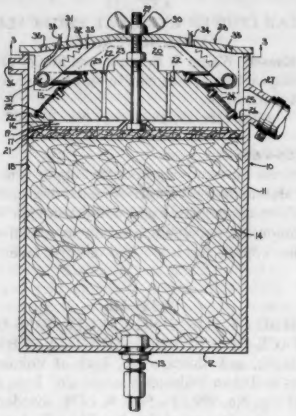
(b) means for receiving and comparing the signals from said power level detecting means and said maximum threshold power level signal producing means; and

(c) means for producing a coolant block signal or coolant run-back signal when the signal from said power level detecting means exceeds the signal from said maximum threshold power level signal producing means, said coolant block signal or run-back signal being received by said flow rate control means whereby said recirculation means is operated to block the change in the core coolant flow rate or run-back the flow rate.

## 4,337,119
## OIL RECLAIMING APPARATUS HAVING ULTRAVIOLET STERILIZER THEREIN

**Jerome T. Donahue, 970 S. Waterville Rd., Oconomowoc, Wis. 53066**

**Filed Apr. 10, 1981, Ser. No. 252,946**
**Int. Cl.³ C10G *31/06, 31/09, 32/00***
**U.S. Cl. 196—46** **2 Claims**



1. An apparatus for sterilizing and removing volatile impurities from lubricating oil comprising:

(a) a container;

(b) an evaporation plate positioned within said container, said evaporation plate defining the floor of an evaporation chamber within such container;

(c) a plurality of passages passing through said evaporation plate from the base thereof to the top surface of said plate;

(d) enclosure means for enclosing the top of the container and defining the top of said evaporation chamber;

(e) means for heating the evaporation plate; and

(f) an ultraviolet radiation source positioned above said evaporation plate and below said enclosure means, said ultraviolet radiation source being capable of directing sufficient radiation upon oil passing across the top of the evaporation plate to sterilize said oil;

(g) vent means to permit vaporized materials to escape from said evaporation chamber, and means for conducting the oil from said evaporation chamber.

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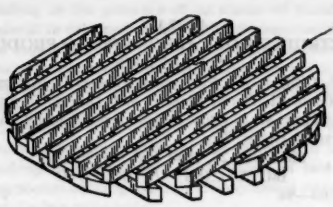
## 4,337,120
## BAFFLE SYSTEM FOR STAGED TURBULENT BED

**Byron G. Spars, Mill Valley; Paul W. Tamm, Oakland, and P. Henrik Wallman, Berkeley, all of Calif., assignors to Chevron Research Company, San Francisco, Calif.**

**Filed Apr. 30, 1980, Ser. No. 145,290**
**Int. Cl.³ C10B *1/04***
**U.S. Cl. 196—125** **5 Claims**

1. An improved retorting vessel for pyrolyzing a granular oil shale containing a mixture of fluidizable and non-fluidizable particles, said retort characterized as a vertically elongated vessel designed for the downward passage of the granular oil shale in generally countercurrent flow to a stripping gas passing upward through the retort, said retort further having a plurality of vertical baffles internally disposed for limiting the gross vertical backmixing of solids and for increasing the residence time of the non-fluidizable particles in the retort, the improvement comprising, said retorting vessel having a diameter of at least one meter and having present in the interior of said retort at least 4 vertically spaced, horizontally disposed,

perforated baffles, each of said baffles having an open area in the range of 30–70% of the baffle cross-sectional area, said




open area being comprised of holes having a maximum dimension in the range of 3.8 to 10 centimeters.

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**4,337,121**

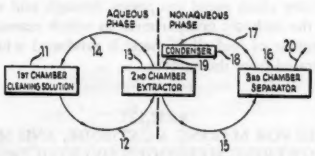
## APPARATUS FOR REMOVING ORGANIC COMPONENTS FROM AN AQUEOUS CLEANING SOLUTION

**Joseph J. English, Sycamore, Ill., assignor to Earl J. Kintz, Chicago, Ill., a part interest**

**Division of Ser. No. 687,520, May 18, 1976, Pat. No. 4,162,199. This application May 25, 1978, Ser. No. 909,208**

**Int. Cl.³ B01D** *3/00, 11/04*

**U.S. Cl. 202—169** **14 Claims**




1. An apparatus for cleaning organic contaminants from parts with a cleaning solution and removing said organic contaminants from said cleaning solution comprising:

(A) a cleaning solution capable of dissolving said contaminants to thereby become organic components in said solution;

(B) a container for holding said solution;

(C) a solvent substantially immiscible with and of a different specific gravity than said solution, said solvent having greater solubility for said organic components than said cleaning solution;

(D) extracting means, separate from said container, for:

(1) establishing intimate contact between said cleaning solution and said solvent; and

(2) retaining, subsequent to said intimate contact, said solution and said solvent;

(E) first carrying means, in fluid communication with said container and said extracting means, for transporting a portion of said cleaning solution from said container to said extracting means;

(F) second carrying means in fluid communication with said container and said extracting means for transporting said cleaning solution from said extracting means to said container after intimate contact with said solvent;

(G) separating means for substantially removing said organic components from said solvent;

(H) third carrying means, in fluid communication with said extracting means and said separating means for transporting solvent, after contact with said cleaning solution, from said extracting means to said separating means; and

(I) fourth carrying means, in fluid communication with said separating means and said extracting means, for transporting said solvent from said separating means to said extracting means after said organic components have been substantially removed from said solvent.

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**4,337,122**

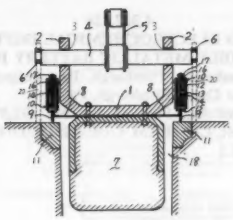
## COKE OVEN DOOR

**Tetsuo Kurihara, Matsuda, Japan, assignor to Koritsu Machine Industries, Ltd., Tokyo, Japan**

**Filed Dec. 19, 1980, Ser. No. 218,023**

**Int. Cl.³ C10B** *25/06, 25/12, 25/16*

**U.S. Cl. 202—248** **3 Claims**



1. In a coke oven, a combination comprising a door body having side plates; upper and lower supporting holes formed horizontally in said side plates; upper and lower locking bars each extending through one of said holes and having an axis of rotation and two spaced ends; and a pair of rollers mounted on each of said locking bars at the respective ends thereof and turnable about an axis which is eccentric relative to said axis of rotation, said rollers being adapted for engagement with latching hooks projecting from the sealing frame of the door.

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**4,337,123**

## PROCESS FOR THE PRODUCTION OF FUEL ALCOHOL, WITHOUT VINASSE

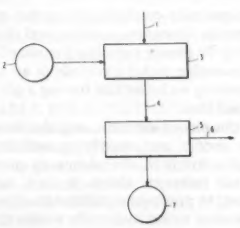
**Alvaro De Sa, and Jacob M. Luksenberg, both of Rio de Janeiro, Brazil, assignors to Versa Consultoria Technica LTDA., CGC, Rio de Janeiro, Brazil**

**Filed Aug. 29, 1980, Ser. No. 182,361**

**Claims priority, application Brazil, Aug. 31, 1979, 7905624; May 30, 1980, 7905624**

**Int. Cl.³ B01D** *3/14, 21/01*

**U.S. Cl. 203—19** **12 Claims**



1. A process for the production of fuel alcohol, without producing vinasse as an undesirable byproduct, from fermented plant mashes comprising after fermentation of said mashes and before distillation the fermented mash is treated by at least two of the operations listed below, which may be applied in the indicated sequence or in different sequences (a to f):

(a) adding chemical nutrient substances and oxygen to the fermented mash in an amount sufficient to cause biological digestion of digestable substances in the fermented mash,

(b) adding a sufficient amount of a flocculating agent to cause flocculation of said fermented mash;

(c) treating with an alkaline material at temperatures from

60° C. to 105° C. in an amount sufficient to cause reaction with soluble compounds not eliminated by steps (a) and (b);

(d) decanting solids in suspension with removal and filtration of the sediment, separating and returning to the flow the liquid part obtained after said filtration;

(e) precipitating substances by addition of alcohol to the liquid, with subsequent separation of salts;

(f) adding an acid to the liquid to precipitate insoluble salts and subsequently neutralizing;

and thereafter distilling to recover alcohol from said liquid.

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4,337,124

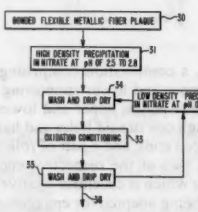
## NON-PULSED ELECTROCHEMICAL IMPREGNATION OF FLEXIBLE METALLIC BATTERY PLAQUES

**Nicholas J. Maskalick, Pittsburgh, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.**

**Filed Aug. 14, 1981, Ser. No. 292,976**

**Int. Cl.³ H01M *4/04*; C25D *11/00***

**U.S. Cl. 204—2.1** **10 Claims**




1. A method of loading porous, flexible, expansible metallic battery plaques with active material comprising the steps of:

(a) immersing a porous, flexible, expansible metallic plaque and a consumable nickel electrode in an electrolyte solution comprising nickel nitrate having a pH of between 2.0 and 2.8, and then

(b) making the plaque cathodic and the consumable nickel electrode aniodic and supplying sufficient continuous, non-pulsed current to the plaque to provide a current density of between about 20 mA./sq.cm. and 100 mA./sq.cm., to precipitate active material comprising bivalent nickel hydroxide within the plaque pores, and then

(c) electrochemically oxidizing the active material in alkaline hydroxide formation solution, and then

(d) immersing the plaque containing oxidized active material and a consumable nickel electrode in an electrolyte solution comprising nickel nitrate having a pH of between 2.0 and 2.8, and then

(e) making the plaque cathodic and the consumable nickel electrode anodic and supplying sufficient continuous, non-pulsed current to the plaque to provide a current density of between about 2 mA./sq.cm. and 10 mA./sq.cm., to precipitate additional active material comprising bivalent nickel hydroxide within the plaque pores.

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4,337,125

## ELECTROCHEMICAL SYNTHESIS OF ORGANOPHOSPHORUS COMPOUNDS FROM THE ELEMENT

**Mark A. Kuck, Upper Montclair, N.J., and Gary K. Miller, Port Chester, N.Y., assignors to Stauffer Chemical Company, Westport, Conn.**

**Filed Dec. 8, 1980, Ser. No. 213,773**

**Int. Cl.³ C25B *3/00, 3/12***

**U.S. Cl. 204—59 R** **13 Claims**

1. A process for the preparation of organophosphorus derivatives of organic hydroxyl or sulfhydryl compounds which includes the step of electrolyzing said organic hydroxyl or sulfhydryl compounds in an electrochemical cell having an anode comprising elemental phosphorus.

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4,337,126

## ELECTROLYSIS OF CARBONATES TO PRODUCE HYDROXIDES

**Thomas J. Gilligan, III, Painesville; Thomas G. Strempel, Euclid; Martin M. Dorio, Mentor, and Andrew D. Babinsky, Chagrin Falls, all of Ohio, assignors to Diamond Shamrock Corporation, Dallas, Tex.**

**Filed Oct. 27, 1980, Ser. No. 201,209**

**Int. Cl.³ C25B *1/16, 1/02, 1/00***

**U.S. Cl. 204—98** **9 Claims**

1. An electrolytic process for recovering alkali metal hydroxide from a solution consisting essentially of the carbonate of said alkali metal, comprising:

(1) an electrolytic cell having a cation permselective membrane which separates the cell into two compartments, namely a cathodic compartment and an anodic compartment;

(2) feeding said solution of carbonates into the anodic compartment, and maintaining an alkali metal hydroxide solution, in the cathodic compartment which is electrolytically conductive under the conditions of the process;

(3) heating the contents of the anodic compartment to a temperature above ambient temperature and maintaining the contents of said anodic compartment at said above ambient temperature throughout the process;

(4) passing an electrical current through the electrolytic cell, whereby alkali metal ion passes through said membrane into the cathodic compartment in which essentially pure hydroxide of said alkali metal is produced while $CO_2$ is generated from the anolyte.

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4,337,127

## METHOD FOR MAKING A CATHODE, AND METHOD FOR LOWERING HYDROGEN OVERVOLTAGE IN A CHLOR-ALKALI CELL

**Terry M. Copeland, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.**

**Division of Ser. No. 128,111, Mar. 7, 1980, Pat. No. 4,298,447. This application May 26, 1981, Ser. No. 267,081**

**Int. Cl.³ C25B *1/34, 11/04***

**U.S. Cl. 204—98** **28 Claims**

11. A method for lowering the operating voltage of a chloralkali electrolysis cell which comprises an anode, a cathode, an anode compartment, a cathode compartment, and a fluorine-containing cation exchange membrane which separates said compartments, said method comprising adding particles comprising grains of alpha-iron in an amount of about 1 g or more per $dm^2$ of membrane area to said cathode compartment.

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4,337,128

## CUPRIC AND FERRIC CHLORIDE LEACH OF METAL SULPHIDE-CONTAINING MATERIAL

**Carl Haakonsen, Kristiansand, and Thomas Thomassen, Brekkestoe, both of Norway, assignors to Elkem a/s; Falconbridge Nikkelverk A/S, both of, Norway; Falconbridge Nickel Mines, Ltd. and The Superior Oil Company, both of, Canada**

**Filed Apr. 16, 1981, Ser. No. 254,955**

**Claims priority, application Norway, Oct. 7, 1980, 802986**

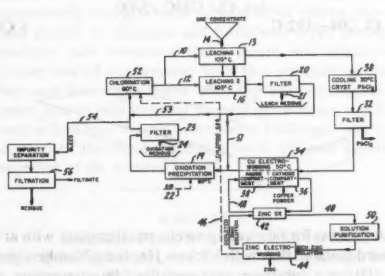
**Int. Cl.³ C25C *1/12, 1/16*; C22B *3/00***

**U.S. Cl. 204—107** **14 Claims**

13. A continuous hydrometallurgical process for recovery of metals from metal-sulphide materials containing one or more metal-sulphides of copper, iron, lead and zinc in accordance with the red-ox principle in which the leach liquor is recycled in a closed loop which comprises the steps of:

(a) supplying regenerated leach liquor containing ferric and cupric chlorides simultaneous in a split flow to a primary and a separate secondary red-ox leaching step;

(b) supplying metal-sulphide containing material to said primary leaching step and carrying out said primary leaching in the presence of an excess of metal-sulphide material in relation to said oxidized compounds of ferric and cupric chlorides in said leach liquor to extract a portion of said metals as soluble chlorides from said material;
(c) separating the leach liquor containing said soluble metal chlorides from said material;
(d) conducting said separated material to the secondary leaching step and subjecting the material to secondary leaching in the presence of an excess of said oxidized compounds of ferric and cupric chlorides in relation to the metal-sulphide material;
(e) separating the residue of said material from the leach liquor in said secondary leaching step;
(f) cooling the liquor from said primary leaching step to precipitate and remove lead chloride;
(g) after removing lead chloride, conducting said leach liquor to the cathode compartment of a diaphragm electrolysis cell and removing metallic copper at the cathode;
(h) conducting leach liquor from the cathode compartment of said cell to separate treatment for extraction of zinc chloride;

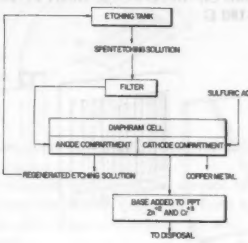


(i) contacting said leach liquor with an organic liquor in said separate treatment to remove zinc chloride and thereafter returning said leach liquor to the anode compartment of said cell for regeneration by chloride ions in the anode compartment of said cell;
(j) contacting the organic liquor with an aqueous medium to strip zinc chloride from said organic liquor;
(k) conducting said aqueous medium with zinc chloride therein to the cathode compartment of a diaphragm electrolysis cell to remove metallic zinc at the cathode and generate chlorine at the anode;
(l) recycling the anolyte from said cell for use as the aqueous medium for stripping zinc chloride from said organic liquor;
(m) conducting the anolyte from the copper extraction cell to further regeneration by oxidation and chlorination to precipitate iron and form fresh leach liquor which is recycled in a closed loop for red-ox leaching of said metal-sulphide material;
(n) combining said leach liquor from said secondary leaching step with the anolyte from the copper extraction cell to subject said secondary leach liquor at least to chlorine regeneration.

## 4,337,129
## REGENERATION OF WASTE METALLURGICAL PROCESS LIQUOR

**David M. Soboroff; Jerry D. Troyer, and Andrew A. Cochran, all of Rolla, Mo., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.**

**Continuation-in-part of Ser. No. 37,089, May 8, 1979, abandoned. This application Oct. 24, 1980, Ser. No. 200,111**
**Int. Cl.³ C02F 1/46**
**U.S. Cl. 204—151** **7 Claims**



1. A method of regenerating an exhausted aqueous hexavalent chromium solution containing trivalent chromium ions and extraneous metal ions including copper ions, comprising:
providing an electrolytic cell comprising a cathode compartment and at least one anode compartment, said cathode compartment having at least one cathode located therein, and said anode compartment consisting essentially of a removable container formed by a framework having a cation selective membrane secured to at least one side thereof, and said container being located within, but unattached to, the cathode compartment and having at least one anode located therein,
placing said exhausted chromium solution, as anolyte, in the anode compartment of said cell, and placing aqueous sulfuric acid, as catholyte, in the cathode compartment of said cell, and
impressing a direct current across the anode and cathode of said cell of a difference in potential sufficient to promote oxidation of trivalent chromium in the anolyte to hexavalent chromium, while the extraneous metal ions in the anolyte migrate through said membrane into the catholyte where copper ions are plated on the cathode.

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## 4,337,130
## PHOTOCURABLE POLYURETHANE FILM COATINGS

**Leo Ahramjian, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.**

**Continuation-in-part of Ser. No. 162,915, Jun. 25, 1980, abandoned. This application Mar. 26, 1981, Ser. No. 244,531**
**Int. Cl.³ C08F 2/50; C08J 3/28**
**U.S. Cl. 204—159.15** **14 Claims**

1. A photocurable polyurethane composition consisting essentially of the following components:
(1) a polyurethane made from
(a) an aliphatic diisocyanate,
(b) a poly(hexamethylene isophthalate)glycol having a number average molecular weight of about 500–1600, and
(c) 1,4-butanediol; with the provisos that the respective mole ratios of components (a), (b), and (c) are 1–2:1:0–1; and the total amount of components (b) and (c) is about equivalent to the amount of component (a);
(2) a photopolymerizable polyfunctional acrylate or methacrylate ester in an amount of about 2–15% based on the weight of component (1);
(3) an amount of a photoinitiator effective to cause compo-

nent (2) to polymerize in the presence of ultraviolet light; and
(4) an antioxidant.

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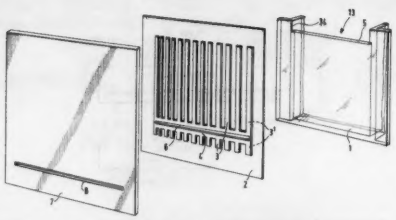
4,337,131
PROCESS FOR ELECTROPHORESIS
Olof Vesterberg, Saltsjö-Duvnäs, Sweden, assignor to C. Desaga GmbH Nachf. Erich Fecht, Heidelberg, Fed. Rep. of Germany
Filed Nov. 13, 1979, Ser. No. 94,308
Claims priority, application Sweden, Nov. 13, 1978, 7811720; Fed. Rep. of Germany, Nov. 2, 1979, 2944127
Int. Cl.[3] B01D 57/02; G01N 21/26
U.S. Cl. 204—180 G 5 Claims



1. In an electrophoretic process for the investigation, analysis, and/or production of chemical substances, in which the substances to be investigated or the starting materials for the substances to be produced are transported in aqueous solution in a gel carrier medium for inhibiting or stabilizing convective transport under the action of an electric field wherein the aqueous solution contains reagents which form precipitates with the substances to be quantitatively determined, and, due to electrophoretic transport in the aqueous phase of the carrier medium, these reagents result in the production of precipitation over a migration distance which is proportional in length to the amount of the substances being determined; and in which process the electrophoretic transport is carried out in a vertical carrier medium which is in the form of a thin layer held between at least two plate-like or film-like elements which are moveable with respect to each other, such that the opposite ends of the carrier medium are in direct contact with buffer solution contained in respective electrode containers associated with each of the ends, and such that after the electrophoretic transport one of the side surfaces of the carrier medium, which medium is in the form of a thin layer, is exposed by the removal of at least one of the plate-like or film-like elements, the improvement wherein the electrophoretic transport is carried out in a carrier medium in the form of a thin layer which is divided into multiple essentially parallel strips.

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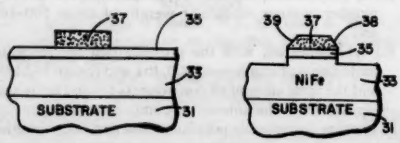
4,337,132
ION ETCHING PROCESS WITH MINIMIZED REDEPOSITION
Addison B. Jones, Yorba Linda, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.
Filed Nov. 14, 1980, Ser. No. 206,929
Int. Cl.[3] C23C 15/00; C23F 1/00
U.S. Cl. 204—192 E 7 Claims




1. The method of minimizing redeposition of underlying thin layer material which is removed by ion impact through a patterned resist mask, comprising the steps of:
(a) determining the etching rates by ion impact of said resist mask and said underlying material in selected atmospheres;
(b) interposing a thin layer of getter mask material between said resist mask and said underlying material, said getter mask material etching very slowly in a said selected atmosphere, relative to said resist mask and said underlying material;
(c) selecting the relative thicknesses and etching rates of said resist mask, said underlying material, and said getter mask material to cause the portions of said getter mask material not protected by said resist mask to be removed by said ion impact shortly prior to faceting of the resist mask to the protected portions of said getter mask material in a selected first atmosphere; and
(d) continuing etching by ion impact in a selected different atmosphere to remove the resist mask and reduce the thickness of the exposed getter mask material, thereby to minimize redepositing.

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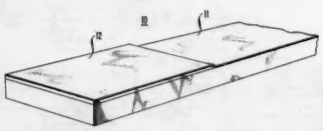
4,337,133
HARD GOLD SURFACES
Jacques A. Augis, Pickerington, and Christopher C. C. Lo, Whitehall, both of Ohio, assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.
Continuation of Ser. No. 50,342, Jun. 20, 1979, abandoned. This application Dec. 18, 1980, Ser. No. 217,914
Int. Cl.[3] C23C 15/00
U.S. Cl. 204—192 C 6 Claims



1. A process for fabricating an electrical contact with at least one hard metallic film with Vickers Hardness Numbers greater than 100 on a substrate, said metallic film comprising gold, comprising the step of sputtering a gold alloy composition onto the substrate using a carrier gas characterized in that the gold alloy composition consists essentially of between 0.05 and 5 weight percent noble refractory metal remainder gold, said noble refractory metal consisting essentially of at least one element selected from the group consisting of rhodium and ruthenium and the substrate is maintained at a temperature below 80 degrees C. during the sputtering procedure.

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4,337,134
CONTINUOUS TRUCK MOUNTED PRINTED CIRCUIT BOARD PLATING SYSTEM
Richard O. Norman, Oxnard, Calif., assignor to Elfab Corporation, Dallas, Tex.
Filed Feb. 27, 1980, Ser. No. 125,245
Int. Cl.[3] C25D 17/06, 21/04, 21/10
U.S. Cl. 204—198 16 Claims

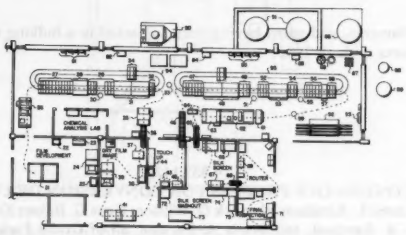
1. A continuous article processing system, comprising:
a series of sequentially arranged article treatment tanks;
a trolley track formed in a loop with a portion of said track overlying said treatment tanks, said track including two rails disposed one from the other in generally parallel spaced alignment;
a plurality of trolley trucks mounted for movement upon said track, each said trucks including means for supporting an article to be processed and energizable vertical drive means for raising and lowering said article into and out of said processing tanks;

energizable horizontal drive means for moving each of said trolley trucks along said track;

a set of control busses, including a power bus, a ground bus and a control bus, extending around the loop between said trolley rails, said power and ground busses being continuous and said control bus being segmented with the interruptions therein located directly above each of said treatment tanks;

means mounted on said trolley trucks for engaging each of said busses;

an automatically resetting timer associated with each of the segments of said control bus;



control means responsive to said timer reaching a preselected value for applying power to said control bus to sequentially energize said vertical drive means and raise said article, to energize said horizontal drive means and energize said horizontal drive means and advance the trolley out of engagement with that segment of control bus and into engagement with the next successive segment, and to energize said vertical drive means and lower said article into the next successive treatment tank under control of the timer associated with the next successive segment of the control bus.

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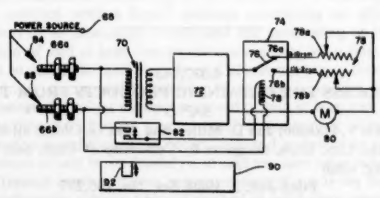
**4,337,135**

## BARREL PLATING APPARATUS

**Carrol D. Quinton, Lemont, and Raphael Guio, Chicago, both of Ill., assignors to Bunker Ramo Corporation, Oak Brook, Ill.**

**Division of Ser. No. 949,305, Oct. 6, 1978, Pat. No. 4,257,853.**
**This application Jun. 30, 1980, Ser. No. 164,582**
**Int. Cl.³ C25D *21/10***
**U.S. Cl. 204—213** **15 Claims**




1. In an apparatus for metal plating a work load which is carried generally in a path of travel from a preplating treatment tank or the like, through air into and out of a plating tank, and from said plating tank to a postplating treatment tank or the like;

means for moving said work load along said path of travel; and

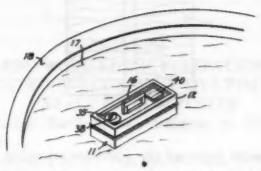
means for rotating said work load during at least portions of its movement along said path of travel, including means for rotating said work load at a first rate of rotation while in said plating tank and a varying rate of rotation while in air when the work load is removed from said plating tank.

**4,337,136**

## DEVICE FOR PURIFYING WATER

**Vincent M. F. Dahlgren, 320 Osborne St., Vista, Calif. 92083**

**Filed Mar. 2, 1981, Ser. No. 239,700**
**Int. Cl.³ C25B *11/10***
**U.S. Cl. 204—242** **2 Claims**



1. A self-contained purifying device for a body of water comprising:

a container adapted to float on the surface of the water,

a pair of spaced electrodes depending from said container,

each of said electrodes comprising an alloy of silver and copper, and

a direct current electric circuit connected between said electrodes,

said circuit including a current source contained in said container,

said circuit causing an ionizing current to pass between said electrodes whereby to destroy bacteria and algae in the water, and

wherein said alloy comprises about 99½ percent copper and ½ percent silver by weight.

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**4,337,137**

## COMPOSITE ION EXCHANGE MEMBRANES

**Bobby R. Ezzell, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.**

**Filed Jun. 11, 1980, Ser. No. 158,423**
**Int. Cl.³ C25B *9/00, 13/08***
**U.S. Cl. 204—252** **24 Claims**

1. In a polymeric composite film of the type having two layers which differ in equivalent weight, each of said layers having a substantially completely fluorinated polymeric backbone with a plurality of pendant groups attached thereto, at least a portion of said pendant groups being a chain of carbon atoms which may be interrupted with one or more oxygen atoms and which terminates with an ion exchange group; wherein the improvement comprises:

the two layers differing in equivalent weight from each other by less than 150 and the carbon chain which connects the ion exchange group to the polymeric backbone having from 1 to 3 carbon atoms.

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**4,337,138**

## ELECTROLYSIS ELECTRODE

**Glenn E. Stoner, and George L. Cahen, Jr., both of Charlottesville, Va., assignors to Research Corporation, New York, N.Y.**

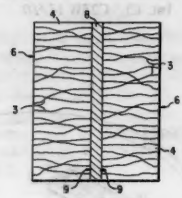
**Division of Ser. No. 935,155, Aug. 21, 1978, Pat. No. 4,285,796.**
**This application Mar. 9, 1981, Ser. No. 242,028**
**Int. Cl.³ C25B *11/02*; C25B *11/04***
**U.S. Cl. 204—290 R** **23 Claims**

1. An electrode, which comprises:

an electrically conductive current collector; and

a working surface containing a multiplicity of conductive islands in a non-conducting matrix wherein the majority of said islands are in electrically conductive contact with said current collector wherein the average size of said

conductive islands and the average spacing between said conductive islands are of the same order of magnitude as the diffusion layer of the solution intended to be treated when said electrode is immersed into said solution.

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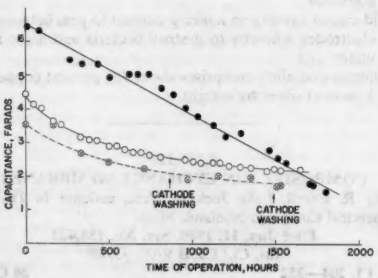
**4,337,139**

## FLUORINATED CARBON ELECTRODE

**Lawrence J. Gestaut, Painesville, Ohio, and Frank Solomon, Great Neck, N.Y., assignors to Diamond Shamrock Corporation, Dallas, Tex.**

**Filed Oct. 31, 1980, Ser. No. 202,581**
**Int. Cl.³ C25B *11/03, 11/04;* H01M *4/92***
**U.S. Cl. 204—292** **6 Claims**




1. Partially fluorinated active carbon particles of the formula $CF_x$, where x=from 0.1 to about 0.18 having an ash content of less than about 4 weight percent, a B.E.T. surface area of at least 600 $m^2/g$ and containing precious metal catalyst.

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**4,337,140**

## STRENGTHENING OF CARBON BLACK-TEFLON-CONTAINING ELECTRODES

**Frank Solomon, Great Neck, N.Y., assignor to Diamond Shamrock Corporation, Dallas, Tex.**

**Filed Oct. 31, 1980, Ser. No. 202,876**
**Int. Cl.³ C25B *11/03, 11/04;* H01M *4/92***
**U.S. Cl. 204—292** **5 Claims**

1. An electrode active layer comprising a mixture containing particulate carbon black and fibrillated unsintered polytetrafluoroethylene in chopped admixture with sintered polytetrafluoroethylene fibers.

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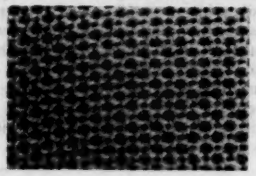
**4,337,141**

## CATION EXCHANGE MEMBRANE

**Itaru Watanabe; Isamu Wataya, and Sakae Tsushima, all of Yokohama, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan**

**Filed Aug. 5, 1980, Ser. No. 175,375**
**Claims priority, application Japan, Aug. 10, 1979, 54-101180**
**Int. Cl.³ B01D *13/02***
**U.S. Cl. 204—301** **5 Claims**

1. A reinforced cation exchange membrane comprising a cation exchange membrane formed of a resin material and a sheet of a woven fabric made of folded yarns of glass fiber filaments, said yarns having been subjected to a bulking treatment with air jets.



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**4,337,142**

## CONTINUOUS PROCESS FOR CONVERSION OF COAL

**Curtis L. Knudson; Warrack G. Willson; Gene G. Baker; Everett A. Sondreal, and Sylvia A. Farnum, all of Grand Forks, N. Dak., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.**

**Filed May 29, 1980, Ser. No. 154,351**
**Int. Cl.³ C10G *1/00***
**U.S. Cl. 208—8 LE** **9 Claims**

1. A continuous process of converting low rank coal to liquid and gaseous products wherein plugging due to carbonate salt formation is reduced, which process comprises reacting crushed low-rank coal containing about 12 to 30% by weight of water dissolved in a solvent at a temperature in the range of about 455° to 500° C., under pressure of a $H_2/CO$ gas mixture in the range of about 2000 to 5000 psi, for a liquid residence time in the range of about 20 to 60 minutes, said solvent comprising a fraction of liquid product characterized as having about 55% by weight of product which distils at less than 250° C. at 1 mm of pressure, about 20% of which is soluble in THF, and about 25% of which is a mixture of carbon polymer and indigenous inorganic matter; said solvent being further characterized as containing at least about 5 weight % of partially hydrogenated aromatics and little or no alkylated aromatics or higher alkanes.

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**4,337,143**

## PROCESS FOR OBTAINING PRODUCTS FROM TAR SAND

**Francis V. Hanson; Jan D. Miller, and Alex G. Oblad, all of Salt Lake City, Utah, assignors to University of Utah, Salt Lake City, Utah**

**Filed Jun. 2, 1980, Ser. No. 155,257**
**Int. Cl.³ C10G *1/02; 1/04***
**U.S. Cl. 208—11 R** **14 Claims**

1. A process for recovering products from tar sand comprising:

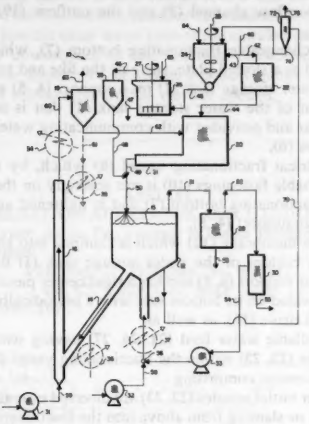
obtaining a tar sand having a negligible amount of connate water;

preparing a tar sand feed from the tar sand, said tar sand feed comprising a bitumen-rich concentrate containing at least about 35% sand by weight;

recovering products from the tar sand feed by passing the tar sand feed into a fluidized bed while heating the tar sand feed in the fluidized bed;

removing a coked sand from the fluidized bed;

producing a hot, burnt sand by burning coke residue on the coked sand; and



providing heat to the tar sand in the fluidized bed by recycling at least a portion of the hot, burnt sand.

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**4,337,144**

## ALUMINUM PASSIVATION PROCESS

**Jin S. Yoo, Flossmoor, Ill., assignor to Atlantic Richfield Company, Philadelphia, Pa.**

**Filed May 19, 1980, Ser. No. 150,851**

**Int. Cl.³ C10G *11/04, 11/18***

**U.S. Cl. 208—120** **13 Claims**

1. In a process for converting a hydrocarbon material having at least one metal contaminant selected from the group consisting of nickel, vanadium, iron and copper which comprises contacting the hydrocarbon material in a reaction zone at hydrocarbon conversion conditions with a catalyst containing a catalytically effective amount of at least one zeolite and about 0.75% to about 2% by weight of all of said metal contaminant to form a conversion product and a deactivated catalyst having carbonaceous deposits and containing at least a portion of said metal contaminant, and regenerating at least a portion of said deactivated catalyst to restore at least a portion of its catalytic activity by removing at least a portion of said carbonaceous deposits to form a regenerated catalyst, the improvement which comprises: contacting at least a portion of said regenerated catalyst with a liquid medium containing an effective amount of an aluminum compound for passivating at least a portion of said at least one metal contaminant for a time sufficient to permit at least a portion of aluminum atoms from said aluminum compound to transfer to at least a portion of said regenerated catalyst without removal of said at least one metal contaminant to form a treated catalyst containing aluminum atoms from said aluminum compound, and transferring at least a portion of said treated catalyst to said reaction zone, whereby said treated catalyst has an improved catalytic activity beyond that otherwise achieved by removal of an equivalent amount of metal contaminants, if any, removed by the claimed process.

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**4,337,145**

## FLUID CATALYTIC CRACKING PROCESS

**Hosheng Tu, Irvine, Calif., assignor to UOP Inc., Des Plaines, Ill.**

**Division of Ser. No. 195,909, Oct. 10, 1980, Pat. No. 4,305,845. This application May 26, 1981, Ser. No. 267,097**

**Int. Cl.³ C10G *47/04, 11/05***

**U.S. Cl. 208—120** **7 Claims**

1. A fluid catalytic cracking process which comprises contacting a hydrocarbon charge stock at fluid catalytic cracking conditions with a zeolitic catalyst having a water content of less than about 1.5 wt. %, said catalyst having been prepared by contacting a zeolitic catalyst having a water content of greater than about 1.5 wt. % with a water-miscible organic fluid, and thereafter calcining said zeolitic catalyst at a temperature of less than about 1200° F.

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**4,337,146**

## HYDROCARBON DEHYDROCYCLIZATION WITH AN ATTENUATED SUPERACTIVE MULTIMETALLIC CATALYTIC COMPOSITE

**George J. Antos, Bartlett, Ill., assignor to UOP Inc., Des Plaines, Ill.**

**Continuation-in-part of Ser. No. 80,639, Oct. 1, 1979, Pat. No. 4,256,608, which is a continuation-in-part of Ser. No. 18,811, Mar. 7, 1979, Pat. No. 4,210,524, which is a continuation-in-part of Ser. No. 833,332, Sep. 14, 1977, Pat. No. 4,165,276. This application Dec. 8, 1980, Ser. No. 214,391**

**The portion of the term of this patent subsequent to Nov. 10, 1998, has been disclaimed.**

**Int. Cl.³ C10G *35/06***

**U.S. Cl. 208—139** **25 Claims**

1. A method for dehydrocyclizing a dehydrocyclizable hydrocarbon comprising contacting the hydrocarbon at hydrocarbon dehydrocyclization conditions with an acidic catalytic composite comprising a combination of a catalytically effective amount of a pyrolyzed rhenium carbonyl component with a porous carrier material containing catalytically effective amounts of a halogen component, an iron component and a uniform dispersion of a catalytically effective amount of a platinum group component maintained in the elemental metallic state.

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**4,337,147**

## CATALYTIC COMPOSITE AND PROCESS FOR USE

**Robert R. Frame, Glenview, Ill., assignor to UOP Inc., Des Plaines, Ill.**

**Division of Ser. No. 91,929, Nov. 7, 1979, Pat. No. 4,290,913, which is a continuation-in-part of Ser. No. 927,318, Jul. 24, 1978, Pat. No. 4,206,079, which is a continuation-in-part of Ser. No. 880,723, Feb. 24, 1978, Pat. No. 4,124,493. This application Aug. 26, 1980, Ser. No. 181,339**

**The portion of the term of this patent subsequent to Apr. 7, 1998, has been disclaimed.**

**Int. Cl.³ C10G *27/06***

**U.S. Cl. 208—206** **13 Claims**

1. A method of treating a mercaptan-containing sour petroleum distillate by contacting said distillate at oxidation conditions with a catalytic composite comprising a metal chelate, an alkali metal hydroxide, and a quaternary ammonium hydroxide disposed on an adsorptive support, the quaternary ammonium hydroxide represented by the structural formula

$$\left[\begin{array}{c} R \\ | \\ R'-N-R \\ | \\ R \end{array}\right] {}^{+}OH^{-}$$

wherein R is a hydrocarbon radical containing up to about 20 carbon atoms and selected from the group consisting of alkyl, cycloalkyl, aryl, alkaryl and aralkyl and R′ is a substantially straight-chain alkyl radical containing from about 5 to about 20 carbon atoms, said alkali metal hydroxide comprising at least about 10 wt. % of said catalytic composite.

## 4,337,148
## LEAD PRESSURED EXTRACTION OF CARBONACEOUS MATERIAL

James E. Dick, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Oct. 20, 1980, Ser. No. 198,517
Int. Cl.³ C10G 1/00
U.S. Cl. 208—8 LE 5 Claims

1. A process for extracting carbonaceous materials from extractable starting materials containing such carbonaceous material using a solvent under elevated temperature and high pressure conditions in a system including an extraction zone said process comprising

subjecting said starting materials and solvent in contact with each other to the hydrostatic pressure of molten lead in order to establish said high pressure in said extraction zone by said molten lead and

maintaining the lead in said system at a temperature sufficiently above its melting point to prevent solidification of the lead in the system.

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## 4,337,149
## PROMOTERS FOR USE IN THE ANIONIC CIRCUIT OF FROTH FLOTATION OF MINERAL ORES

Saul J. Escalera, Dublin, Ohio, assignor to Sherex Chemical Company, Inc., Dublin, Ohio

Filed May 11, 1981, Ser. No. 262,417
Int. Cl.³ B03D 1/02
U.S. Cl. 209—166 30 Claims

1. In a froth flotation process where preselected solid particles are selectively separated under anionic froth flotation conditions as a froth phase from remaining solid feed particles as an aqueous phase in the presence of an anionic collector, the improvement characterized by the addition of an effective proportion of an amine oxide promoter for improving the selectivity of recovery of said preselected particles.

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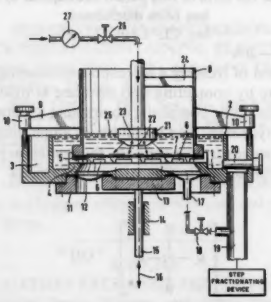
## 4,337,150
## FIBER FRACTIONATING DEVICE

Anton Breunig, Anhausen, Fed. Rep. of Germany, assignor to Haindl Papier GmbH, Augsburg, Fed. Rep. of Germany

PCT No. PCT/DE79/00004, § 371 Date Sep. 17, 1979, § 102(e) Date Sep. 17, 1979, PCT Pub. No. WO79/00530, PCT Pub. Date Aug. 9, 1979
PCT Filed Jan. 16, 1979, Ser. No. 185,909
Claims priority, application Fed. Rep. of Germany, Jan. 19, 1978, 2802207
Int. Cl.³ D21F 1/00; B07B 1/00
U.S. Cl. 209—237 11 Claims




1. In a fiber fractionating device, preferably for the determination of the content of coarse particles, such as chips or the like, in wood fiber materials, said device consisting of

an essentially cylindrical water storage tank (1) open at the top, having an overflow edge (2), and overflow channel (3) surrounding said overflow edge (2) with an outlet (19) surrounding said overflow edge (2) and a closable drain orifice (20) that connects the water storage tank (1) with the overflow channel (3) and the outflow (19), respectively,

an interchangeable fractionating bottom (7), which is designed as a slotted plate, sieve or the like and rests inside the water storage tank (1) on a support (4, 5) above the bottom of the water storage tank (1) that is essentially annular and provided with communicating water passage orifices (6),

a cylindrical fractionating vessel (8) which, by means of detachable fastenings (10) is put sealingly on the edge of the fractionating bottom (7) and is tightened against the annular support (4, 5),

a flexible membrane (12) which is clamped into an opening in the bottom of the water storage tank (1) within the annular support (4, 5) and has a rigid center piece (13) that is provided on its bottom side with a periodically pulsatable lift drive (16), as well as

a controllable water feed (21, 26, 27) having water outlet nozzles (22, 23) within the fractionating vessel (8),

the improvement comprising

the water outlet nozzles (22, 23) are directed essentially from above or slanting from above into the fractionating vessel (8) and that their orifices are arranged on and/or below the level of the overflow edge (2),

the means (9, 10) for the detachable fastening of the fractionating vessel (8) are disposed above the overflow edge (2) on the fractionating vessel (8),

the water storage tank (1) and the fractionating vessel (8)—aside from the annular support (4, 5)—have only smooth walls and are without components, protrusions and edges which would hinder the flow and favor the deposit of fibers, and

two closable discharge orifices (17, 20) are provided—one of them at the lowest spot of the outer annular space of the water storage tank (1) limited by the annular support (4, 5) and the other one at the lowest spot in the zone of the flexible membrane (12) within the annular support (4, 5).

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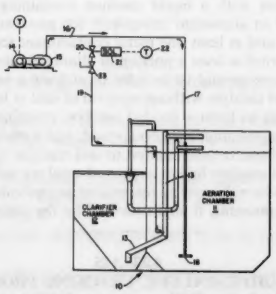
## 4,337,151
## METHOD AND APPARATUS FOR PULSED TIMED CONTROL FOR SLUDGE RETURN LINE

Gary A. Crosby, New Iberia, La., assignor to Red Fox Industries Inc., New Iberia, La.

Filed Dec. 29, 1980, Ser. No. 220,775
Int. Cl.³ C01C 1/26
U.S. Cl. 210—139 1 Claim




1. In a sewage treatment apparatus, an aeration chamber, a clarification chamber having a clear water zone, a sludge return line extending from the bottom of said clarification chamber to the top of said aeration chamber, an air service line supplying air from a blower to a lower portion of said sludge return line, apparatus for periodically pulsing air to said sludge

return line comprising a solenoid controlled valve in said air service line to said sludge return line, timing means for periodically pulsing the air to said sludge return line so that eddy currents in the clarification chamber are reduced to retard flow of sludge into the clear water zone of the clarifier, and a metering valve downstream of said solenoid controlled valve to regulate the quantity of air supplied to said sludge return line when said solenoid controlled valve is opened.

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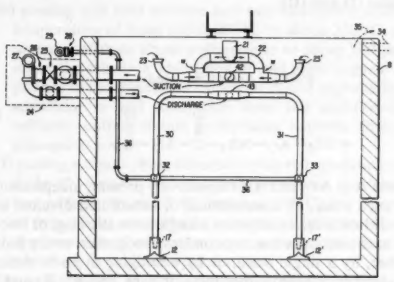
**4,337,152**

## AERATION APPARATUS AND METHOD

**John F. Lynch, Aston, Pa., assignor to Frebar Holding AG, Zug, Switzerland**

**Filed Sep. 27, 1978, Ser. No. 946,141**
**Int. Cl.³ C02F 3/22; B01F 3/04**
**U.S. Cl. 210—197** **3 Claims**




1. In an apparatus for treating waste water with a gas such as air, oxygen or other oxygen containing gas in an activated sludge aeration process including:

(a) an outer mixing vessel;

(b) outlet means from said outer mixing vessel for continuous withdrawal of mixed gas and waste water which form the contents of said outer mixing vessel;

(c) a pre-mixing draft tube substantially vertically axially aligned within said outer mixing vessel and having an upper end and a lower end;

(d) a nozzle opening at the lower end of said draft tube;

(e) mixing means for mixing the contents of said outer mixing vessel with incoming raw waste water and recycled activated sludge, said mixing means connected to the upper end of said draft tube and supplying the contents, raw waste water and activated sludge to said draft tube;

(f) said mixing means comprising a trough means for receiving the raw waste water and recycled activated sludge and a conduit means connecting said trough means to said draft tube, said conduit means having a funnel opening therein located within the contents of said outer mixing vessel for introducing the contents and the sewage into said draft tube;

(g) air inlet means for introducing the air directly into said draft tube between the upper and lower ends thereof for mixing the air with the sewage and contents flowing through the draft tube; and

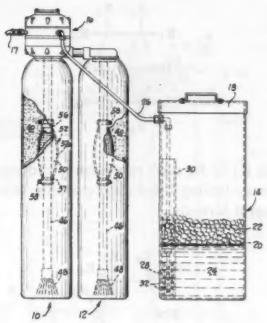
(h) pump means for pumping the mixed contents and liquid through said draft tube; the improvement comprising said conduit means including a loop having a top portion connected to said trough means and a bottom portion within which the funnel opening is located whereby waste water flowing into the trough means initially flows into the loop in opposing directions which eventually converge and the funnel opening is located at the point in the loop where the convergence begins.

**4,337,153**

## WATER SOFTENING APPARATUS

**William C. Prior, Newbury, Ohio, assignor to Kinetico, Inc., Newbury, Ohio**

**Filed Aug. 22, 1980, Ser. No. 180,374**
**Int. Cl.³ B01J 47/14**
**U.S. Cl. 210—288** **10 Claims**



1. A water softening apparatus, comprising:

(a) a tank defining a volume containing water softening material;

(b) a fluid conduit extending longitudinally in said tank, defining an inlet at one end for introducing fluid, to be treated, into said tank;

(c) structure defining an outlet spaced from said inlet for discharging fluid from said tank after passing through at least a portion of said water softening material;

(d) an elastomeric member disposed within said tank, defining an expansible chamber having one side of a chamber wall in fluid communication with fluid flowing in said conduit upstream of said inlet and another side of said wall in fluid communication with fluid flowing through said portion of said water softening material;

(e) said chamber expanding in response to the net fluid force exerted on said chamber wall by the fluid flowing in said conduit and the fluid flowing in said portion of said water softening material, said chamber operative during fluid flow to enlarge to maintain compactness of the water softening material.

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**4,337,154**

## CROSSLINKED COMPOSITE SEMIPERMEABLE MEMBRANE

**Shuzo Fukuchi; Tetsuzo Hayashi, both of Osaka; Hiroya Kobayashi, Minoo, and Ryoichi Oshiumi, Ibaraki, all of Japan, assignors to Nippon Shokubai Kagaku Kogyo Co., Ltd., Osaka, Japan**

**Filed Apr. 1, 1980, Ser. No. 136,245**
**Claims priority, application Japan, Apr. 4, 1979, 54-39881; Apr. 6, 1979, 54-41124; Apr. 10, 1979, 54-42484**
**Int. Cl.³ B01D 39/16**
**U.S. Cl. 210—490** **7 Claims**

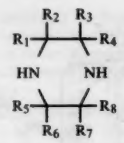
1. A composite semipermeable membrane comprising a porous support and a crosslinked thin film formed on said porous support, said crosslinked thin film being prepared by the process consisting essentially of forming a film consisting essentially of compound (A) and compound (B) on a porous support, contacting said film with a solution of compound (C) and then drying said film to form a crosslinked film,

said compound (A), being at least one compound selected from the group consisting of polyalkylenimines and polyalkylenimine derivatives which have been prepared by the process consisting essentially of reacting part of the amino groups of polyalkylenimines with compounds having functional groups reactive with said amino groups of

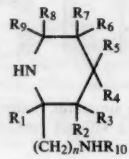
said polyalkylenimines and which have been rendered soluble in water or solvent mixtures comprising mainly water,

said compound (B) being at least one compound selected from the group consisting of:

compound ($B_1$) of the general formula

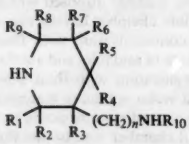


wherein $R_1$ to $R_8$ each represent a hydrogen atom or an alkyl group having 1 to 4 carbon atoms, compound ($B_2$) of the general formula

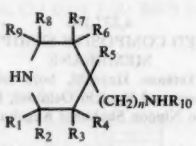


wherein $R_1$ to $R_{10}$ each represent a hydrogen atom, or an alkyl group having 1 to 4 carbon atoms, and n denotes an integer of 1 to 3,

compound ($B_3$) of the general formula

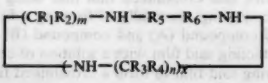


wherein $R_1$ to $R_{10}$ each represent a hydrogen atom or an alkyl group having 1 to 4 carbon atoms, and n denotes an integer of 1 to 3, compound ($B_4$) of the general formula



wherein $R_1$ to $R_{10}$ each represent a hydrogen atom or an alkyl group having 1 to 4 carbon atoms, and n denotes an integer of 1 to 3, and

compound ($B_5$) (excluding compound (A)) of the general formula



wherein $R_1$ to $R_4$ each represent a hydrogen atom or an alkyl group having 1 to 4 carbon atoms; m and n each represent an integer of 2 or 3; x denotes an integer of 1 to 4; $R_5$ and $R_6$ each represent an alkylene group having 1 to 4 carbon atoms; and $R_5$ and $R_6$ may each represent hydrogen atoms or an alkyl group having 1 to 4 carbon atoms without being bonded to each other, and

said compound (C) being a compound having in one molecule two or more functional groups capable of reacting with amino groups.

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**4,337,155**

## CHEMICAL-RESISTANT WHOLLY AROMATIC POLYAMIDE FIBER MATERIAL

**Hideharu Sasaki; Yorikazu Tamura, and Keizo Shimada, all of Iwakuni, Japan, assignors to Teijin Limited, Osaka, Japan**

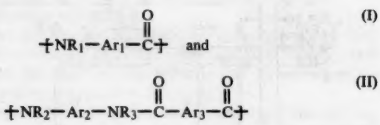
**Filed Jan. 14, 1981, Ser. No. 225,036**

**Claims priority, application Japan, Jan. 22, 1980, 55-5219**

**Int. Cl.³ B01D *31/00;* D02G *3/00***

**U.S. Cl. 210—500.1** **15 Claims**

1. A chemical-resistant wholly aromatic polyamide fiber material, comprising wholly aromatic polyamide fibers each comprising at least one aromatic polyamide containing repeating units selected from the group consisting of those of the formulae (I) and (II):



wherein $Ar_1$, $Ar_2$, and $Ar_3$ respectively present, independently from each other, an unsubstituted or substituted divalent aromatic radical which comprises a single aromatic ring, or two or more aromatic rings that are condensed together, or are linked together, by a single bond, or by a bridging atom or radical, and which is oriented either meta or para, and $R_1$, $R_2$ and $R_3$ each represent independently from each other, a hydrogen atom or an alkyl radical having 1 to 3 carbon atoms, each of which fibers is covered with a coating of a fluorine-containing polymeric resin comprising at least one member selected from the group consisting of tetrafluoroethylene polymers, tetrafluoroethylene-hexafluoropropylene copolymers, tetrafluoroethylene-trifluorochloroethylene copolymers, tetrafluoroethylene-vinylidene fluoride copolymers, tetrafluoroethyleneperfluorovinyl ether copolymers, tetrafluoroethylene-carboxylic acid or sulfonic acid group-containing perfluorovinyl ether copolymers, trifluorochloroethylene polymers, vinyl fluoride polymers, vinylidene fluoride polymers, vinyl fluoride-hexafluoropropylene copolymers, and vinyl chloride-trifluorochloroethylene copolymers, said coating having been derived from an aqueous emulsion of said fluorine-containing polymeric resin.

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**4,337,156**

## ADSORPTIVE SEPARATION OF CONTAMINANTS FROM NAPHTHA

**Armand J. deRosset, Sarasota, Fla., assignor to UOP Inc., Des Plaines, Ill.**

**Filed Sep. 23, 1980, Ser. No. 189,873**

**Int. Cl.³ B01D *15/08***

**U.S. Cl. 210—672** **5 Claims**

1. A process for separating polar organic compounds selected from the group consisting of thiophene, pyridine and phenol from a feed mixture comprising naphtha and said organic compounds which process employs an adsorbent consisting essentially of an X type potassium zeolite containing potassium cations at the cationic sites which exhibits selectivity to selectively adsorb said polar organic compounds while permitting the remaining portion of said naphtha to elute through said adsorbent and which process comprises the steps of:

(a) maintaining net fluid flow through a column of said adsorbent in a single direction, which column contains at least three zones having separate operational functions occuring therein and being serially interconnected with

the terminal zones of said column to provide a continuous connection of said zones;

(b) maintaining an adsorption zone in said column, said zone defined by the adsorbent located between a feed input stream at an upstream boundary of said zone and a naphtha raffinate output stream at a downstream boundary of said zone;

(c) maintaining a purification zone immediately upstream from said adsorption zone, said purification zone defined by the adsorbent located between an extract output stream at an upstream boundary of said purification zone and said feed input stream at a downstream boundary of said purification zone;

(d) maintaining a desorption zone immediately upstream from said purification zone, said desorption zone defined by the adsorbent located between a desorbent input stream at an upstream boundary of said zone and said extract output stream at a downstream boundary of said zone;

(e) passing said feed mixture into said adsorption zone at a temperature of from about 20° C. to about 250° C. and a pressure of from about atmospheric to about 500 psig to effect the selective adsorption of said polar organic compounds to the substantial exclusion of said naphtha by said adsorbent in said adsorption zone and withdrawing a raffinate output stream comprising naphtha from said adsorption zone;

(f) passing a liquid-phase desorbent material consisting essentially of 1-octanol into said desorption zone at a temperature of from about 20° C. to about 250° C. and a pressure of from about atmospheric to about 500 psig to effect the displacement of said polar organic compounds from said adsorbent in said desorption zone;

(g) withdrawing an extract output stream comprising said polar organic compounds from said desorption zone; and

(h) periodically advancing through said column of adsorbent in a downstream direction with respect to fluid flow in said adsorption zone said feed input stream, raffinate output stream, desorbent input stream, and extract output stream to effect the shifting of zones through said adsorbent and the production of said extract output and raffinate output streams.

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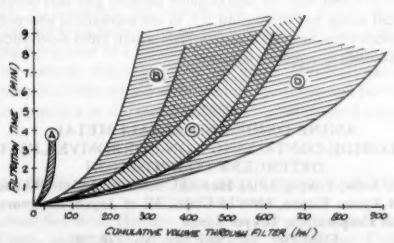
**4,337,157**

## BIOPOLYMER FILTRATION PROCESS

**Timothy G. Bradley, Littleton, Colo., assignor to Manville Service Corporation, Denver, Colo.**

**Filed Mar. 17, 1978, Ser. No. 887,573**
**Int. Cl.³ B01D *15/00***
**U.S. Cl. 210—691** **3 Claims**



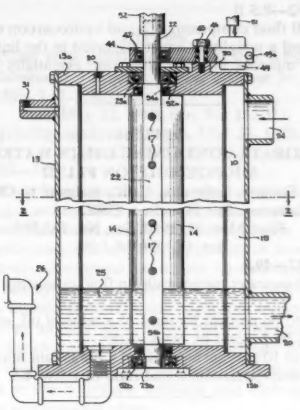

**1.** A process for the filtration of biopolymers for the removal of unhydrated biopolymer material and bacterial debris which comprises contacting a liquid solution of biopolymers with a solid granular adsorbent material have a pH of 8.5 to 10.0 wherein said solid granular adsorbent material is selected from the group consisting of magnesia and synthetic calcium silicate.

**4,337,158**

## CYCLIC WAVE SYSTEM FOR UNCLOGGING WATER SCREENS

**Albert G. Bodine, 7877 Woodley Ave., Van Nuys, Calif. 91406**

**Filed Mar. 10, 1980, Ser. No. 128,736**
**Int. Cl.³ B07B *1/54*; B01D *35/20***
**U.S. Cl. 210—785** **15 Claims**



**14.** A method for unclogging a non-rotating filer screen through which liquid is being flowed comprising the steps of

forming a thin layer of liquid on the downstream side of said filter screen,

generating cyclic pressure pulses on the downstream side of the screen in said thin liquid layer by cyclically traversing a portion of a paddle member along the downstream side of the screen in close proximity thereto,

coupling said pressure pulses through said thin liquid layer and said screen in a direction opposite to the liquid flow through the screen, and

generating vibratory energy pulses at a frequency substantially higher than that of the cyclic pressure pulses and superimposing the vibratory energy pulses on said pressure pulses.

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**4,337,159**

## SHEAR-STABILIZED EMULSION FLOODING PROCESS

**Ronald L. Reed, and Clarence W. Carpenter, Jr., both of Houston, Tex., assignors to Exxon Production Research Company, Houston, Tex.**

**Filed Jun. 19, 1980, Ser. No. 161,195**
**Int. Cl.³ E21B *43/22***
**U.S. Cl. 252—8.55 D** **12 Claims**

**1.** A process for recovering crude oil from a subterranean reservoir penetrated by an injection well and a production well which comprises injecting into said reservoir through said injection well a translucent emulsion having an external microemulsion phase and an internal brine phase containing a water soluble, polymeric viscosifier, said emulsion tending to be stabilized by any shearing force imposed thereon during flow through said reservoir, said external microemulsion phase comprised of water, oil and a surfactant, and being in chemical equilibrium with said internal brine phase with an interfacial tension therebetween of less than $10^{-3}$ dynes/cm; driving said emulsion and said crude oil through said reservoir towards said production well; and recovering said crude oil through said production well.

4,337,160

## ACID SOLUBLE WEIGHTING AGENT FOR WELL DRILLING, WORKOVER AND COMPLETION FLUIDS

Thomas E. Sample, Jr., Houston, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Continuation-in-part of Ser. No. 543,593, Jan. 23, 1975, abandoned. This application May 23, 1980, Ser. No. 153,105

Int. Cl.[3] C09K *7/04, 7/06*

U.S. Cl. 252—8.5 B 3 Claims

1. A well fluid comprising a liquid hydrocarbon or aqueous medium, and a weighting agent dispersed in the liquid hydrocarbon or aqueous medium consisting essentially of ferrous carbonate.

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4,337,161

## BORATE-CONTAINING OIL-IN-WATER MICROEMULSION FLUID

Robert A. Stayner, Lafayette, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Mar. 24, 1980, Ser. No. 133,090

Int. Cl.[3] C10M *1/06*

U.S. Cl. 252—49.5 5 Claims

1. An oil-in-water microemulsion fluid consisting essentially of:

(a) 0.99 to 50 percent by mass of a mineral oil; and

(b) 50 to 99 percent by mass water;

(c) 0.01 to 10 percent by mass of a potassium borate having a boron-to-potassium metal ratio of 2.5 to 4.5.

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4,337,162

## INTERNAL BOUNDARY LAYER CERAMIC COMPOSITIONS

David A. Payne; Sang M. Park, both of Champaign, Ill., and Otto C. Jahnke, El Cajon, Calif., assignors to University of Illinois Foundation, Urbana, Ill.

Continuation-in-part of Ser. No. 23,708, Mar. 26, 1979, Pat. No. 4,237,084. This application May 20, 1980, Ser. No. 151,680

The portion of the term of this patent subsequent to Dec. 2, 1997, has been disclaimed.

Int. Cl.[3] H01B *3/12;* C04B *35/46, 35/64*

U.S. Cl. 252—62.3 BT 10 Claims

1. A semi-conducting composition having a grain size less than 10 microns comprising:

about 55.0–99.98% by weight of a polycrystalline alkaline earth metal titanate;

about 0.01–10% by weight of a hexavalent metal oxide having the formula $(MO_3)(Bi_2O_3)_x$, where M is tungsten or molybdenum and x is 0–7, said oxide being incorporated in said titanate to provide semiconductivity thereto; and

about 0.01–35% by weight of a lead germanate composition having the formula $(PbO)_x(GeO_2)_{y-z}(SiO_2)_z$ where x is 1–6, y is 1–3, and z is 0–0.75y,

said lead germanate composition forming an insulating boundary layer about the grains of said semiconducting titanate.

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4,337,163

## LIQUID, THICKENED CHLORINE BLEACHING COMPOSITION

Ulrich Schilp, Vlaardingen, Netherlands, assignor to Lever Brothers Company, New York, N.Y.

Filed Nov. 21, 1980, Ser. No. 209,189

Claims priority, application Netherlands, Dec. 5, 1979, 7908798

Int. Cl.[3] C11D *7/54, 9/30, 9/44*

U.S. Cl. 252—96 5 Claims

1. Liquid, thickened chlorine bleaching composition having a pH of 10–12.5 and a viscosity of about 10 to 150 cS at a temperature of 25° C., comprising an aqueous, hypochlorite-ion yielding solution in an amount such that the composition has an active chlorine content of 1–10% by weight, said composition containing as thickening agent 0.5–5% by weight of a mixture of (1) a hypochlorite-soluble first detergent active compound selected from the group consisting of a tertiary amine oxide having one branched or straight $C_{8-18}$ alkyl chain and two short chain alkyl groups, $C_{8-18}$ alkyl-substituted betaines, quaternary ammonium compounds and mixtures thereof, and (2) a second detergent active compound selected from the group consisting of an alkali metal salt of a fully saturated $C_{8-18}$ fatty acid, an alkali metal acylsarcosinate, an alkali metal alkyltauride, a sugar ester, an alkali metal $C_{10-18}$ alkylether sulphate containing 1–10 moles of ethylene oxide and/or propylene oxide and mixtures thereof, the weight ratio of the hypochlorite-soluble first detergent active compound to the second detergent active compound being from 75:25 to 40:60, the composition further comprising from 50–350 m mol/kg of a buffer salt selected from the group consisting of alkali metal salts of orthophosphoric acids, alkali metal salts of silicic acids, alkali metal salts of carbonic acids and mixtures thereof.

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4,337,164

## BLEACH COMPOSITION

Anthony H. Clements, Cefn y Bedd, Wales, assignor to Lever Brothers Company, New York, N.Y.

Continuation-in-part of Ser. No. 176,750, Aug. 11, 1980, abandoned. This application Feb. 24, 1981, Ser. No. 237,793

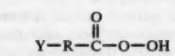
Claims priority, application United Kingdom, Aug. 16, 1979, 7928590

Int. Cl.[3] C11D *9/42*

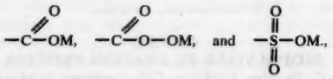
U.S. Cl. 252—96 6 Claims

1. A bleach composition consisting essentially of:

(a) 0.1–40 parts by weight of an organic peracid having the general formula:



wherein R is an alkylene group containing from 1–16 carbon atoms or an arylene group containing from 6–8 carbon atoms and Y is selected from the group consisting of hydrogen, halogen, alkyl, aryl,



wherein M is hydrogen or a water soluble salt forming cation; and

(b) 0.1–40 parts by weight of a water-soluble bromide salt which delivers bromide ions in aqueous media; the molar equivalent ratio of said organic peracid and said bromide salt being not more than 5:1, in the substantial absence of aldehydes, ketones and materials which yield aldehydes or ketones in aqueous solution.

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4,337,165

## AMINE OXIDE-AND ALKALI METAL CHLORIDE-CONTAINING NON-CORROSIVE LIQUID DETERGENT COMPOSITION

Hideo Ando, Tokyo; Akira Hayashi, Sakura; Haruo Ohkouchi, and Kyozo Kitano, both of Chiba, all of Japan, assignors to Lion Corporation, Tokyo, Japan

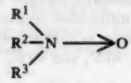
Filed Dec. 15, 1980, Ser. No. 216,290

Claims priority, application Japan, Dec. 18, 1979, 54-164356

Int. Cl.[3] C11D *1/83, 7/10*

U.S. Cl. 252—105 6 Claims

1. In a non-corrosive liquid detergent composition comprising, based on the total weight of the composition, 5 to 40% by weight of an anionic surface active agent, 1 to 10% by weight of an amine oxide represented by the following general formula:



wherein $R^1$ stands for a linear or branched alkyl group having 10 to 20 carbon atoms, and $R^2$ and $R^3$ each stand for a methyl or ethyl group, and 0.5 to 5% by weight of an alkali metal chloride, the improvement comprising adding 0.04 to 1.5% by weight of at least one inorganic salt selected from the group consisting of sulfites and thiosulfates to the composition, based on the total weight of the composition.

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4,337,166

## COMPOSITIONS FOR TREATING HAIR AND OTHER FIBROUS MATERIALS

**Michael P. L. Hill, St. Lythans, and Petrina F. Fridd, Penarth, both of Wales, assignors to Dow Corning Limited, Barry, Wales**

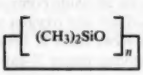
**Filed Apr. 17, 1981, Ser. No. 255,188**

**Claims priority, application United Kingdom, Apr. 19, 1980, 8012933**

**Int. Cl.³ C11D *17/00***

**U.S. Cl. 252—174.15** **6 Claims**

1. A liquid detergent composition consisting essentially of one or more detergent substances and from 0.5 to 20 percent by weight, based on the total weight of the composition, of at least one cyclic siloxane represented by the general formula



in which n has a value of from 3 to 6 inclusive.

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4,337,167

## CONTAINER FOR RADIOACTIVE NUCLEAR WASTE MATERIALS

**John M. Bird, 681 Snyder Hill Rd., Ithaca, N.Y. 14850, and Alfred E. Ringwood, 3 Vancouver St., Red Hill, Canberra, Australian Capitol Territory 2603, Australia**

**Continuation of Ser. No. 878,113, Feb. 15, 1978, Pat. No. 4,192,765. This application Feb. 5, 1980, Ser. No. 118,818**

**The portion of the term of this patent subsequent to Mar. 11, 1997, has been disclaimed.**

**Int. Cl.³ G21F *1/08***

**U.S. Cl. 252—633** **18 Claims**

11. A container for radioactive nuclear waste materials which are ultimately to be buried underground, said container being composed of a nickel-iron alloy having the properties of those natural minerals produced under thermodynamically stable conditions within serpentinite-type rocks and possessing a composition in the range exhibited by the mineral awaruite.

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4,337,168

## ALKOXYSILANE CLUSTER EMULSIONS AND THEIR PREPARATION

**Michael Scardera, Hamden, and Alan Norwid, Ansonia, both of Conn., assignors to Olin Corporation, New Haven, Conn.**

**Filed Sep. 10, 1981, Ser. No. 300,836**

**Int. Cl.³ B01J *13/00***

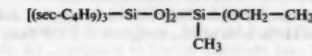
**U.S. Cl. 252—312** **10 Claims**

1. A stable emulsion system comprising:

(a) an aqueous phase comprising water;

(b) an organic phase comprising tris(tri-sec-butoxysiloxy)-methylsilane; and

(c) a surfactant having the formula:



wherein n is from about 8 to 16 and R′ is either a methyl or ethyl group.

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4,337,169

## PROCESS FOR PRODUCING MICROCAPSULES

**Tetsuro Shimazaki, Takasago, Japan, assignor to Mitsubishi Paper Mills, Ltd., Tokyo, Japan**

**Filed May 22, 1980, Ser. No. 152,311**

**Claims priority, application Japan, May 29, 1979, 54-66502**

**Int. Cl.³ B01J *13/02***

**U.S. Cl. 252—316** **14 Claims**

1. A process for producing microcapsules, which comprises emulsifying in an emulsifier-containing aqueous phase a hydrophobic substance substantially insoluble therein, adding as membrane-forming precursor components, at least one aromatic hydroxy compound, urea and formaldehyde, further adding to the system an amino acid having only one amino group as a discoloration reducing agent, the amino acid being present in an amount effective to reduce the discoloration caused by the aromatic hydroxy compound, and allowing said precursor components to polymerize to form a polymerizate membrane at the interphase between said hydrophobic substance and said aqueous phase.

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4,337,170

## CATALYTIC STEAM REFORMING OF HYDROCARBONS

**Andrija Fuderer, Antwerp, Belgium, assignor to Union Carbide Corporation, Danbury, Conn.**

**Filed Jan. 23, 1980, Ser. No. 114,566**

**Int. Cl.³ C01B *3/38, 3/48***

**U.S. Cl. 252—373** **12 Claims**

1. An improved process for the catalytic stream reforming of fluid hydrocarbons comprising:

(a) catalytically reacting a major portion of a fluid hydrocarbon feed stream with steam in catalyst-containing reformer tubes positioned within a first primary reforming zone maintained at an elevated temperature by radiant heat transfer and/or by contact with combustion gases, the hot reformer tube effluent comprising a first reformed gas mixture which is passed directly to the hot discharge end of the reformer tubes in the second primary reforming zone;

(b) catalytically reacting the remaining portion of said hydrocarbon feed stream with steam at an elevated temperature in a second primary reforming zone having catalyst-containing reformer tubes positioned therein, the hot effluent from said tubes comprising a second reformed gas mixture;

(c) combining the first and second reformed gas mixtures at the hot discharge end of the reformer tubes of said second primary reforming zone, thus forming a hot combined reformer gas stream within said second primary reforming zone at the hot discharge end of the reformer tubes therein;

(d) passing the hot combined reformer gas stream countercurrently on the shell side of said second primary reaction zone, thereby supplying heat to maintain said second primary reforming zone at an elevated temperature; and

(e) withdrawing the thus-partially cooled combined reformer effluent stream, comprising a combination of said first and second reformed gas mixtures, from said second primary reaction zone, whereby the desired overall steam reforming is accomplished at a substantial reduction in hydrocarbon fuel consumption.

4,337,171

## ORGANIC BOUND ADSORBENTS

Santi Kulprathipanja, Hoffman Estates, and Armand J. deRosset, Clarendon Hills, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Filed Jun. 18, 1980, Ser. No. 160,521
Int. Cl.[3] B01J *20/18, 20/22*
U.S. Cl. 252—430 17 Claims

1. An adsorbent comprising a mixture of a Type X or Type Y zeolite, from about 5.0 wt% to about 35.0 wt% of a alkali or alkaline earth exchange resin and from about 20.0 wt% to about 35.0 wt% of a water permeable organic polymer binder, wherein the weight ratio of said Type X or Type Y zeolite to said alkali or alkaline earth exchange resin is from about 1.0 to about 3.0.

2. The adsorbent of claim 1 further characterized in that said water permeable organic polymer comprises a cellulose ester or cellulose nitrate.

6. A method for the manufacture of an adsorbent comprising a Type Y or Type X zeolite, from about 5.0 wt% to about 35.0 wt% of an alkali or alkaline earth exchange resin and from about 20.0 wt% to about 35 wt% of a water permeable organic polymer binder, wherein the weight ratio of said Type X or Type Y zeolite to said alkali or alkaline earth resin is from about 1.0 to about 3.0 which comprises:

(a) mixing together a powder of said Type X or Type Y zeolite, a powder of said alkali or alkaline earth exchange resin, a powder of said water permeable organic polymer binder and a liquid organic solvent to produce a malleable mixture;

(b) forming said malleable mixture into discrete formations;

(c) removing said solvent from said formations to produce hard dry formations; and

(d) breaking said hard dry formations to produce particles of desired size.

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4,337,172

## ENHANCED IMMOBILIZATION OF A GLUCOSE ISOMERASE

John R. Teague, Darien, and Aronson L. Huebner, Woodbridge, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Filed Jan. 15, 1981, Ser. No. 225,559
Int. Cl.[3] B01J *31/06*
U.S. Cl. 252—430 25 Claims

1. A method of enhancing the subsequent immobilization of glucose isomerase onto a support matrix comprising impregnating said matrix, prior to contact with said glucose isomerase, with at least 0.1 millimoles divalent magnesium ion per gram of support matrix, and recovering the resulting magnesium impregnated support matrix.

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4,337,173

## SOLID-SOLUTION TYPE CRYSTALLINE OXIDES AND THEIR PRECURSORS

Masayuki Otake, Yokohama, Japan, assignor to Mitsubishi Chemical Industries, Ltd., Tokyo, Japan

Filed Sep. 22, 1980, Ser. No. 189,346
Int. Cl.[3] B01J *27/14;* C01B *15/16*
U.S. Cl. 252—435 9 Claims

1. A process for preparing a crystalline oxide comprising:

dissolving a pentavalent vanadium compound, a pentavalent phosphorus compound, a compound of at least one element selected from the group consisting of iron, chromium and aluminum, and hydrazine hydrochloride in water to form a homogeneous aqueous solution containing tetravalent vanadium, pentavalent phosphorus, chloride ion and said one element in relative amounts providing an atomic ratio of 0.8 to 1.25 for phosphorus to the total quantity of vanadium, iron, chromium and aluminum, and an atomic ratio of 0.01 to 0.4 for the total quantity of iron, chromium and aluminum to the total quantity of vanadium, iron, chromium and aluminum, and

concentrating and evaporating the solution to dryness to provide a solid-solution type crystalline oxide precursor of vanadium phosphorus, oxygen and said one element having an X-ray diffraction spectrum (Cu-K$\alpha$ anticathode) with main peaks at diffraction angles ($2\theta$) of 15.7°, 19.8°, 24.4°, 27.3°, 30.6°, and 40.6°.

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4,337,174

## METHOD FOR PREPARING A CATALYST AND INTERMEDIATE FORMED THEREBY

Ramon A. Mount, and Harold Raffelson, both of St. Louis, Mo., assignors to Monsanto Company, St. Louis, Mo.

Continuation of Ser. No. 73,480, Sep. 7, 1979, abandoned, which is a continuation-in-part of Ser. No. 698,458, Jun. 21, 1976, abandoned. This application Feb. 2, 1981, Ser. No. 232,441
Int. Cl.[3] B01J *27/18*
U.S. Cl. 252—437 8 Claims

1. A method of preparing a catalyst which comprises:

(A) bringing together in a reaction zone a phosphorus compound and a vanadium compound in a phosphorus to vanadium atom ratio between about 0.8:1 and about 1.5:1 under acidic solutions in the absence of hydrogen halide to provide at least 50 atom percent tetravalent vanadium and to form a phosphorus-vanadium-oxygen complex;

(B) heating the said complex at a temperature between about 60° C. and about 120° C. for a period of time sufficient to form and precipitate an oxide compound which comprises phosphorus, vanadium and oxygen wherein the phosphorus to vanadium atom ratio is between about 0.8:1 and about 1.5:1 and having major X-ray diffraction peaks of:

| d-spacing |
|---|
| 6.70 |
| 5.68 |
| 3.34 |
| 3.16 |
| 3.09 |

in a precipitant comprising water;

(C) heating said composition in a liquid comprising water at a temperature between about 130° C. and about 170° C. for a period of 2–6 hours to form a catalyst precursor;

(D) drying the catalyst precursor;

(E) calcining the catalyst precursor at a temperature between about 300° C. and about 600° C.

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4,337,175

## CATALYST FOR THE PREPARATION OF ETHYLENIMINE

Enrique G. Ramirez, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed Jul. 14, 1980, Ser. No. 167,881
Int. Cl.[3] B01J *23/20*
U.S. Cl. 252—455 R 5 Claims

1. A dehydration catalyst which consists essentially of an oxide of tantalum or niobium together with an alkaline earth oxide as a promoter on an inert support.

5. The catalyst of claim 1, 2, 3, or 4 wherein the alkaline earth oxide is barium oxide.

4,337,176

## PROCESS FOR THE PREPARATION OF CRYSTALLINE SILICATES

Michael A. M. Boersma; Johannes M. Nanne, and Martin F. M. Post, all of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Dec. 4, 1980, Ser. No. 212,957

Claims priority, application Netherlands, Dec. 13, 1979, 7908984

Int. Cl.³ B01J *21/06, 23/74*

U.S. Cl. 252—459 2 Claims

1. Crystalline iron silicates having the following properties:

(a) thermally stable up to a temperature above 600° C.,

(b) an X-ray powder diffraction pattern showing, inter alia, the reflections given in Table A of the specification,

(c) in the formula that represents the composition of the silicate, expressed in moles of the oxides, and in which, in addition to oxides of hydrogen, alkali metal and silicon iron oxide is present, the $SiO_2/Fe_2O_3$ molar ratio (m) is more than 10, which process comprises said silicates being prepared according to a process which comprises maintaining at a temperature between about 90° to about 300° C. for a period of 4 hours or more, until the crystalline silicate is formed, an aqueous mixture containing the following compounds:

one or more compounds of an alkali metal (M), one or more amines with the general formula $R_1R_2R_3N$, in which $R_1$ represents an alkyl group and $R_2$ and $R_3$ represent an alkyl group or a hydrogen atom, one or more silicon compounds which yield, after drying at 120° C. and calcining at 500° C., a product with an $SiO_2$ content higher than 90%w and one or more iron compounds, in which mixture the compounds, with the exception of the amines, are present in the following molar ratios, expressed in moles of the oxides:

$M_2O$: $SiO_2$=0.01–0.35,

$R_1R_2R_3N$: $SiO_2$=0.04–1.0,

$SiO_2$: $Fe_2O_3$>10, and

$H_2O$: $SiO_2$=5–65,

then separating said crystalline silicate from the mother liquor, and calcining said separated silicate.

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4,337,177

## CATALYST FOR HYDROGENATION OF UNSATURATED DINITRILES

Charles A. Drake, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 69,200, Aug. 23, 1979, Pat. No. 4,259,262. This application Oct. 15, 1980, Ser. No. 197,382

Int. Cl.³ B01J *21/04, 21/08, 21/12, 23/46*

U.S. Cl. 252—466 PT 7 Claims

1. A catalyst composition consisting essentially of:

a catalyst component selected from the group consisting of elemental ruthenium, ruthenium compounds which are reducible by hydrogen to elemental ruthenium, and mixtures thereof; and

a granular catalyst support, wherein said granular catalyst support has an irregular shape and has a diameter in the range of from about 0.5 inch (1.27 cm) diameter to about 30 mesh.

4,337,178

## CATALYST FOR STEAM REFORMING OF HYDROCARBONS

Kenton Atwood, New Albany, Ind., and James H. Wright, Louisville, Ky., assignors to United Catalysts Inc., Louisville, Ky.

Continuation-in-part of Ser. No. 24,005, Mar. 26, 1979, Pat. No. 4,233,187, which is a continuation-in-part of Ser. No. 817,160, Jul. 20, 1977, abandoned, which is a continuation-in-part of Ser. No. 708,941, Jul. 27, 1976, abandoned. This application Oct. 29, 1980, Ser. No. 201,992

The portion of the term of this patent subsequent to Nov. 11, 1997, has been disclaimed.

Int. Cl.³ B01J *21/04, 23/78*

U.S. Cl. 252—466 J 3 Claims

1. A hydrocarbon reforming catalyst comprising a cylindrical refractory support selected from the group consisting of aluminum oxide, magnesium oxide, calcium oxide and metal aluminate spinels, and having two or more gas passages extending axially therethrough from one end to the other and a catalytically active metal comprising nickel or cobalt oxide deposited thereon in a concentration of 6% to 30% by weight expressed as the metal oxide, said catalyst having a Relative Activity Coefficient Factor (ACF ®) and a Relative Pressure Factor (PF ®) in excess of that when compared to a standard ring, said ACF ® being in excess of 1 and the ratio of ACF ® to said PF ® being in excess of 1:1, the Height (H) of said support bearing a relationship to the effective internal diameter of each of said gas passages (ID), the ratio of H:ID being less than 4:1.

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4,337,179

## POLYAMIDE COMPOSITION

Hirozo Uejo; Hideo Ishida, both of Hirakata, and Masaaki Shinhama, Osaka, all of Japan, assignors to Ube Industries, Ltd., Yamaguchi, Japan

Filed Jul. 1, 1980, Ser. No. 165,080

Claims priority, application Japan, Jul. 10, 1979, 54-86510; Jul. 10, 1979, 54-86511

Int. Cl.³ H01B *1/06*

U.S. Cl. 252—511 6 Claims

1. An electrically conductive polyamide composition which comprises a polyamide and, incorporated therein, 0.01 to 20% by weight, based on the composition, of imidazole and 5 to 50% by weight, based on the composition, of carbon black.

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4,337,180

## USE OF CYCLOHEXYL PHENETHYLETHER IN AUGMENTING OR ENHANCING THE AROMA OF PERFUMES AND COLOGNES

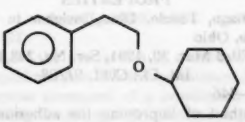
Jacob Kiwala, Brooklyn, N.Y.; Richard J. Tokarzewski, Keyport, N.J.; Frederick L. Schmitt, Holmdel, N.J., and Mark A. Sprecker, Sea Bright, N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 192,238, Sep. 30, 1980, Pat. No. 4,306,096. This application May 28, 1981, Ser. No. 267,851

Int. Cl.³ A61K *7/46;* C11B *9/00*

U.S. Cl. 252—522 R 2 Claims

1. The perfume composition comprising an aroma augmenting or enhancing quantity of cyclohexyl phenethylether having the structure:



and intimately admixed therewith at least one adjuvant compatible therewith from an organoleptic standpoint which is selected from the group consisting of alcohols, aldehydes, ketones, nitriles, ethers other than said cyclohexyl phene-

thylether, lactones, natural essential oils, synthetic essential oils and hydrocarbons.

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4,337,181

## BIODEGRADABLE STARCH-BASED BLOWN FILMS

Felix H. Otey, and Richard P. Westhoff, both of Peoria, Ill., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Jan. 17, 1980, Ser. No. 112,980
Int. Cl.³ C08L 3/02
U.S. Cl. 523—128 10 Claims

1. In a method of producing a flexible, self-supporting, and biodegradable film wherein a mixture comprising a partially or completely gelatinized starchy material in an amount up to 60% by weight and an ethylene acrylic acid copolymer is converted into a plasticized matrix and then shaped into said film, the improvement comprising the following steps:

a. incorporating into said matrix a neutralizing agent selected from the group of aqueous ammonia and anhydrous ammonia;

b. adjusting the moisture content of said matrix to within the range of about 2–10% based on the weight of the matrix; and

c. extrusion blowing said ammoniated and moisture-adjusted matrix into a film.

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4,337,182

## POLY (ARYLENE SULFIDE) COMPOSITION SUITABLE FOR USE IN SEMI-CONDUCTOR ENCAPSULATION

Donald G. Needham, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Mar. 26, 1981, Ser. No. 247,687
Int. Cl.³ C08L 91/00
U.S. Cl. 524—609 15 Claims

1. A method for preparing a composition suitable for molding said method comprising:

(a) melt compounding a masterbatch of glass fiber and poly (arylene sulfide);

(b) reducing said masterbatch to particles;

(c) and blending said masterbatch particles with a sufficient amount of organic silane, additional poly (arylene sulfide) and a component chosen from glass beads and fused silica to provide a composition of about 30 to about 50 weight percent poly (arylene sulfide), about 10 to about 30 weight percent in glass fibers, about 30 to about 60 percent glass beads or fused silica, and about 0.5 to about 3 weight percent organic silane.

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4,337,183

## POLYURETHANE AND POLYETHYLENE RESIN-CONTAINING PRINTING INK HAVING IMPROVED PHYSICAL AND MECHANICAL PROPERTIES

Edgardo Santiago, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Mar. 30, 1981, Ser. No. 248,160
Int. Cl.³ C08L 91/08
U.S. Cl. 524—446 11 Claims

1. The method of improving the adhesion and abrasion resistance of print on a substrate which comprises adding to an aqueous printing ink a major amount of an aqueous mixture of polyurethane resin and polyethylene resin having a solids ratio ranging from about 1:9 to 1:1 and applying by a printing technique the resultant ink mixture to a substrate.

4,337,184

## URETHANE RHEOLOGY MODIFIERS SUBSTANTIALLY FREE OF TERMINAL HYDROPHOBIC GROUPS AND COMPOSITIONS CONTAINING SAME

Karl F. Schimmel, Verona; Jerome A. Seiner, Pittsburgh; Rostyslaw Dowbenko, and Roger M. Christenson, both of Gibsonia, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Dec. 29, 1980, Ser. No. 220,617
The portion of the term of this patent subsequent to Nov. 3, 1998, has been disclaimed.
Int. Cl.³ C08K 5/29
U.S. Cl. 524—726 40 Claims

1. A urethane rheology modifier characterized in having a branched structure, substantially no terminal hydrophobic groups and capable of modifying the rheology properties of water-based and organic solvent-based compositions, derived from the reaction of (a) for each 8 moles of a polyalkylene oxide having a molecular weight of from about 2,000 to about 20,000; (b) from about 0.1 mole to about 3 moles of a polyfunctional material, said material having at least 3 active hydrogens capable of reacting with isocyanate or being a polyisocyanate having at least three isocyanate groups; (c) from about 4 moles to about 15 moles of a diisocyanate; (d) less than about 3 moles water; and (e) an amount of additional diisocyanate to compensate for any water which is present and capable of consuming isocyanate functionality.

29. A coating composition consisting essentially of a film forming polymeric resin and about 0.1% to about 10%, based on the film forming polymeric resin solids, of a rheology modifier, said modifier characterized in having a branched structure, substantially no terminal hydrophobic groups and derived from the reaction of (a) for each 8 moles of a polyalkylene oxide having a molecular weight of from about 2,000 to about 20,000, (b) from about 0.1 mole to about 3 moles of a polyfunctional material, said material having at least 3 active hydrogens capable of reacting with isocyanates or being a polyisocyanate having at least 3 isocyanate groups; (c) from about 4 moles to about 15 moles of a diisocyanate; (d) less than about 3 moles water; and (e) an amount of diisocyanate to compensate for any water which is present and capable of consuming isocyanate functionality.

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4,337,185

## PROCESS FOR MAKING CATIONIC STRUCTURED PARTICLE LATEXES USING REACTIVE POLYMERIC SURFACTANTS

Ritchie A. Wessling, Midland, and Dale M. Pickelman, Sr., Auburn, both of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jun. 23, 1980, Ser. No. 162,289
Int. Cl.³ C08L 41/00
U.S. Cl. 524—458 14 Claims

1. In a process for preparing a latex by free radical catalyzed emulsion polymerization in an aqueous medium in at least one stage, the improvement of introducing a reactive polymeric surfactant in at least one stage of the polymerization process to prepare a structured particle latex; said reactive polymeric surfactant being a substantially linear synthetic water-soluble surfactant whose polymeric backbone is derived from the polymerization of one or more ethylenically unsaturated monomers and which polymeric surfactant has a number average molecular weight of from about 500 to about 40,000 and bears, per gram of such reactive polymeric surfactant, from about 1 to about 4 milliequivalents of pH independent randomly distributed ionic groups and, per polymeric surfactant molecule, and average of at least one water-insensitive reactive fractional group selected from the group consisting of ethylenically unsaturated groups, sulfhydryl groups and epoxy groups; said ethylenically unsaturated monomers being (a) one or more hydrophobic monomers or (b) one or more hydrophobic monomers together with at least one hydrophilic nonionic mono-

mer or ionic monomer or mixtures thereof in such proportions that the amount of the hydrophilic nonionic monomer is less than about 15 percent by weight, based on the weight of the reactive polymeric surfactant; said functional group being either in the polymer backbone or pendant therefrom and providing a crosslinking or grafting site; and said structural particle latex having structured particles consisting of a water-insoluble, non-ionic organic polymer core encapsulated with a layer of a copolymer having pH independent ionic groups chemically bound at or near the outer surface of the structured particle; the amount of said ionic groups being sufficient to provide at least a major portion of the colloidal stability but insufficient to make the polymer water-soluble.

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4,337,186

## HARDENABLE COMPOSITIONS

**Stephen Crisp, Hounslow, and Alan D. Wilson, Liphook, both of England, assignors to National Research Development Corporation, England**

**PCT No. PCT/GB79/00014, § 371 Date Sep. 17, 1979, § 102(e) Date Aug. 9, 1979, PCT Pub. No. WO79/00521, PCT Pub. Date Aug. 9, 1979**

**PCT Filed Jan. 17, 1979, Ser. No. 166,980**

**Claims priority, application United Kingdom, Jan. 17, 1978, 01833/78**

**Int. Cl.³ C08K** *3/22, 3/40, 5/09;* **A61K** *5/06*

**U.S. Cl. 525—362** **27 Claims**

1. A hardenable composition which comprises (i) a poly(carboxylic acid) selected from the group consisting of homopolymers and copolymers of unsaturated aliphatic carboxylic acids or precursor thereof that is converted to said poly(carboxylic acid) on hydrolysis thereof; (ii) a particulate ion-leachable silicate or aluminosilicate glass reactable with (i) in the presence of water to set to a hardened composition; and (iii) an inorganic metal salt which accelerates the setting of the composition selected from the group consisting of a silver (I) salt, a barium salt and a multivalent metal salt, the cation of which has a standard electrode potential $E_{ox}^{o}$ less than 2.6 volts.

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4,337,187

## ELECTROCOATING COMPOSITION WITH POLYHYDROXYAMINE AND POLYESTERS OR ALKYDS

**Isidor Hazan, Clementon, N.J., assignor to E. I. DuPont de Nemours and Company, Wilmington, Del.**

**Continuation-in-part of Ser. No. 106,257, Dec. 21, 1979, abandoned. This application Dec. 29, 1980, Ser. No. 220,955**

**Int. Cl.³ C08L** *29/00, 39/00*

**U.S. Cl. 524—504** **11 Claims**

1. An aqueous cathodic electrodeposition coating composition comprising dispersion of a first polymer, a second polymer, enough of an organic acid to give the composition a pH about in the range of 6 to 7, and optionally a nitrogen resin crosslinker, said coating composition containing, by weight based on the first and second polymers, about 20–70% of a first polymer which is a copolymer comprising a backbone and a graft pendent to the backbone, said backbone containing amine functional groups and hydroxy functional groups, characterized in that said backbone contains at least about 0.13 equivalent of amine groups per 100 grams of first polymer and at least about 0.03 equivalent of hydroxyl groups per 100 grams of first polymer, and containing, by weight, the equivalent of about:

(a) 35–90% amine functional monomers,

(b) 10–60% hydroxy functional monomers,

(c) 0–40% nonfunctional acrylic or methacrylic monomers, and

(d) 0–5% chain-terminating monomers thr total of (a), (b), (c) and (d) being 100% of said backbone,

said graft comprising a monoglycidyl ester of at least one tertiary carboxylic acid containing 9–20 carbon atoms and being grafted to said amine groups in said backbone, said copolymer containing about 1–30% by weight of said graft, and, by weight based on the first and second polymers, about 80–30% of a second polymer which is polyester or alkyd having an acid number of about zero and containing hydroxy functionality or vinyl groups.

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4,337,188

## POLYOLEFIN COMPOSITION FOR MANUFACTURE OF FILM HAVING CLING PROPERTIES

**David C. Climenhage, Kingston, and Walter R. Eadie, North Bay, both of Canada, assignors to Du Pont Canada Inc., Mississauga, Canada**

**Continuation of Ser. No. 104,117, Dec. 17, 1979, abandoned. This application Oct. 24, 1980, Ser. No. 200,198**

**Int. Cl.³ C08K** *5/49*

**U.S. Cl. 524—140** **9 Claims**

1. A polyolefin composition capable of being used for the manufacture of film having cling properties, said composition consisting essentially of

(A) an intimate mixture of about 75–98 weight percent of a first component and about 2–25 weight percent of a second component, wherein the first component is a polyethylene blend comprising from about 10 to about 20 weight percent of at least one homopolymer of ethylene having a density in the range of from about 0.915 to about 0.930 g/cm³ and melt index in the range of from about 0.2 to about 10 with from 80 to about 90 weight percent of at least one copolymer of ethylene and a $C_4$–$C_8$ α-olefin having a density in the range of from about 0.915 to about 0.930 g/cm³ and melt index in the range of from 0.2 to about 5.0, and wherein the second component is an elastomer selected from the group consisting of a copolymer of ethylene and propylene having a Mooney viscosity in the range of from about 15 to about 70 and a copolymer comprised of ethylene, propylene and a non-conjugated diene having a Mooney viscosity in the range of from about 15 to about 70, and

(B) at least about 200 parts per million, based on the weight of (A), of an agent selected from the class consisting of

(a) N,N-bis(2 hydroxyethyl) alkylamine, where the alkyl group is a $C_{12}$–$C_{18}$ alkyl group;

(b) one of

(i) a liquid of waxy solid organic compound selected from the group consisting of N-(3 alkoxy-2 hydroxypropyl) ethanolamine, where the alkyl of the alkoxy group is a $C_{10}$–$C_{18}$ alkyl group, polyethylene glycol and glycerol oleate;

(ii) mineral oil;

(iii) a liquid polyolefin;

(iv) an organic phosphate ester that is a liquid or waxy solid; and

(c) mixtures of agent (a) with agent (b).

7. The composition of claim 1 in which the agent is an organic phosphate ester that is a liquid or a waxy solid.

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4,337,189

## POLYMERIZATION PROCESS

**Charles Bromley, Bourne End, and Morice W. Thompson, Maidenhead, both of England, assignors to Imperial Chemical Industries Limited, London, England**

**Filed Dec. 8, 1980, Ser. No. 214,337**

**Claims priority, application United Kingdom, Dec. 6, 1979, 7942093**

**Int. Cl.³ C08K** *5/09*

**U.S. Cl. 523—332** **9 Claims**

1. A process for the production of a stable dispersion in a non-aqueous liquid medium of microparticles of diameter from 0.01 to 10 microns composed of a crosslinked polymer, the process comprising the steps of (1) polymerising one or more ethylenically unsaturated monomers, including at least one crosslinking monomer, from which the crosslinked polymer is to be derived, in an aqueous medium comprising (a) at least 30% by weight of water and (b) not more than 70% by weight of a second constituent which is miscible with water, the na-

ture and proportion of which are such that the mixture as a whole is capable of dissolving the monomer or monomers being polymerised to the extent of at least 3% by weight but is a non-solvent for the polymer formed, the polymerisation being carried out at a temperature at least 10° higher than the glass transition temperature of the polymer in the presence in the aqueous medium as steric stabiliser of a block or graft copolymer which contains in the molecule (i) a polymeric component which is solvatable by the aqueous medium and which consists of at least one polymer chain derived from a polyethylene glycol of mol. wt. at least 1000, and (ii) another polymeric component which is not solvatable by the aqueous medium, the concentration of free monomer in the polymerisation mixture being maintained throughout this process step at a level such that at no time does the free monomer form a separate phase and the total amount of monomer polymerised being such that the resulting dispersion contains at least 20% by weight of microparticles, and (2) transferring the polymer microparticles from the resulting dispersion into a non-aqueous liquid medium, the said liquid medium being one which is capable of dissolving, to the extent of at least 10% by weight at room temperature, the polyethylene glycol from which the above-mentioned solvatable component of the block or graft copolymer is derived when the said polyethylene glycol is in a non-hydrated state.

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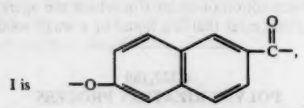
**4,337,190**

## POLYESTER OF 6-HYDROXY-2-NAPHTHOIC ACID AND META-HYDROXY BENZOIC ACID CAPABLE OF READILY UNDERGOING MELT PROCESSING

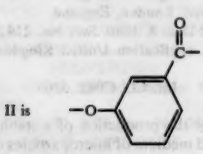
**Gordon W. Calundann, N. Plainfield, N.J., assignor to Celanese Corporation, New York, N.Y.**

**Filed Jul. 15, 1980, Ser. No. 169,014**
**Int. Cl.³ C08K 5/13; C08G 63/18**
**U.S. Cl. 524—599** **35 Claims**

1. A melt processable wholly aromatic polyester capable of forming an optically anisotropic melt phase at a temperature below approximately 400° C. consisting essentially of the recurring moieties I and II which may include substitution of at least some of the hydrogen atoms present upon an aromatic ring wherein:




and




with said optional substitution if present being selected from the group consisting of an alkyl group of 1 to 4 carbon atoms, an alkoxy group of 1 to 4 carbon atoms, phenyl, halogen, and mixtures of the foregoing, and wherein said polyester comprises approximately 10 to 90 mole percent of moiety I, and approximately 10 to 90 mole percent of moiety II.

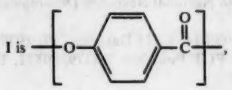
**4,337,191**

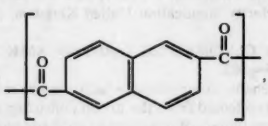
## POLYESTER OF PARA-HYDROXY BENZOIC ACID, 2,6-NAPHTHALENE DICARBOXYLIC ACID, TEREPHTHALIC ACID AND METHYLHYDROQUINONE EXHIBITING IMPROVED HYDROLYTIC STABILITY AND WHICH IS CAPABLE OF FORMING AN ANISOTROPIC MELT

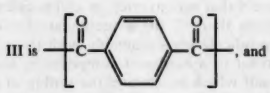
**Nicolai A. Favstritsky, Broomall, Pa., assignor to Fiber Industries, Inc., New York, N.Y.**

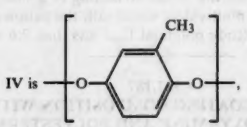
**Filed Nov. 5, 1979, Ser. No. 91,003**
**Int. Cl.³ C08G 63/06**
**U.S. Cl. 524—599** **16 Claims**

1. A melt processable polyester capable of forming an anisotropic melt phase at a temperature below 290° C. consisting essentially of the recurring moieties I, II, III, and IV wherein:




and wherein said polyester comprises approximately 45 to 55 mole percent of moiety I, approximately 15 to 25 mole percent of moiety II, approximately 4 to 10 mole percent of moiety III, and approximately 20 to 30 mole percent of moiety IV.

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**4,337,192**

## THERMOPLASTIC MOLDING COMPOSITION HAVING IMPROVED WARP RESISTANCE AND PROCESS FOR PREPARING THE SAME

**Richard W. Campbell, Evansville, Ind., assignor to General Electric Company, Pittsfield, Mass.**

**Filed Aug. 15, 1980, Ser. No. 178,521**
**Int. Cl.³ C08L 67/02**
**U.S. Cl. 523—212** **10 Claims**

1. An improved thermoplastic molding composition comprising, in intimate admixture:

(a) a poly(1,4-butylene terephthalate) resin;

(b) a poly(ethylene terephthalate) resin;

(c) an impact modifier of a segmented copolyester-ether; and

(d) a filler material selected from the group consisting of finely divided surface treated clay and amorphous silica.

4,337,193

## PREPARATION OF HARDENED TALL OIL PITCH

Jeno G. Szita, Norwalk, Conn., assignor to Arizona Chemical Company, Wayne, N.J.

Filed Apr. 27, 1981, Ser. No. 258,182
Int. Cl.[3] C09F *1/00;* C08K *5/00;* C08L *93/00*
U.S. Cl. 260—97.5 5 Claims

1. Modified tall oil pitch compositions comprising tall oil pitch reacted with at least one additive selected from polycarboxylic acids, polyfunctional amines, polyhydroxyl compounds, alkyl, vinyl and acrylic compounds having one or more amino, hydroxyl or carboxylic functional groups; and further reacted with at least one cross-linking compound selected from polyisocyanates, alkylated and non-alkylated melamine formaldehyde resins, alkylated and non-alkylated urea formaldehyde resins and resole type phenol-formaldehyde resins.

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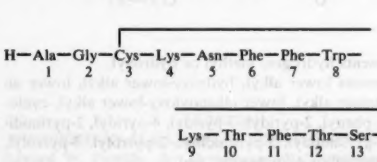
4,337,194

## PROCESS FOR THE PREPARATION OF SOMATOSTATIN

Joseph Diaz, Perols, and Remy Guegan, Castelnau le Lez, both of France, assignors to C. M. Industries, Paris, France

Filed Mar. 3, 1980, Ser. No. 126,993
Claims priority, application France, Mar. 23, 1979, 79 07430
Int. Cl.[3] C07C *103/52*
U.S. Cl. 260—112.5 S 15 Claims

1. Process for the preparation of somatostatin of formula I:




by progressive elongation of the peptide chain from the cysteine in 14 position, by successively coupling each aminoacid or peptide whose amino and thiol groups are previously protected, the α-amino group being released and activated in the form of ester before the reaction of formation of the following peptide bond, wherein the acid function of the starting cysteine is protected by the phenylazobenzylsulfonylethyloxy (OPse) group which renders all the intermediate peptides insoluble in water and the usual organic solvents with the exception of dimethylformamide (DMF) and dimethylsufoxide (DMSO) and makes it possible to effect all the peptide coupling reactions in solution in the DMF or DMSO, to precipitate the intermediate peptides by addition of a second solvent and to purify these peptides by washing in solid phase with the aid of suitable solvents which dissolve the impurities.

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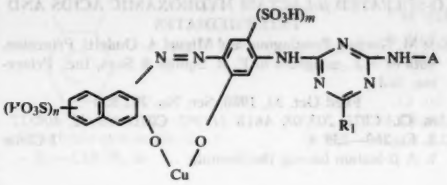
4,337,195

## AZO DYESTUFFS

Hans-Joachim Vater, Cologne; Horst Nickel, Leverkusen, and Hermann Henk, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Oct. 17, 1979, Ser. No. 86,189
Claims priority, application Fed. Rep. of Germany, Nov. 4, 1978, 2847912
Int. Cl.[3] C09B *45/00*
U.S. Cl. 260—146 T 7 Claims

1. Azo dyestuffs of the formula

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wherein

A is the radical of a non-copper-containing monoazo or disazo dyestuff of the naphthalene-azo-benzene, naphthalene-azo benzene-azo-benzene, benzene-azo-benzene, benzene-azo-benzene-azo-benzene, benzene-azo-benzene-azo-naphthalene, benzene-azo-naphthalene, benzene-azo-naphthalene-azo-benzene, benzene-azo-naphthalene-azo-naphthalene or naphthalene-azo-naphthalene series,

$R^1$ is amino, methylamino, dimethylamino, ethylamino, diethylamino, 2-hydroxyethylamino, bix-(2-hydroxyethyl)-amino, alkylamino, dialkylamino, methoxyethylamino, sulphatomethylamino, carboxymethylamino, N-methyl-N-carboxymethylamino, carboxyethylamino, N-methyl-N-sulphatomethylamino, sulphatoethylamino, N-methyl-N-sulphatoethylamino, cyclohexylamino, pyrrolidino, piperidino, 1-methylpiperazino, morpholino, 4-morpholineamino, benzylamino or said phenylamino or naphthylamino being unsubstituted or substituted by hydroxyl, halogen, alkoxy, carboxyl or sulpho, m is 0 or 1 and n is 1 or 2.

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4,337,196

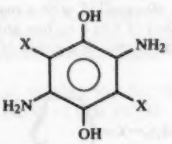
## METHOD FOR PRODUCING 3,6-BIS(CARBOETHOXYAMINO)-2,5-DIAZIRIDINYL-1,4-BENZOQUINONE

Stephen J. Backlund, Fair Oaks, and Robert E. Olsen, Placerville, both of Calif., assignors to United States of America, Washington, D.C.

Filed Aug. 29, 1980, Ser. No. 182,632
Int. Cl.[3] C07D *403/10, 203/14, 403/08*
U.S. Cl. 260—239 EQ 15 Claims

1. A method of preparing a diaziridinyl diaminobenzoquinone-N,N'-dicarboxylate compound selected from dialkyl, di(arylalkyl), or diphenyl diaminobenzoquinone-N,N'-dicarboxylates, said method comprising:

reacting a diaminohydroquinone of the formula:




wherein X is selected from the group consisting of chlorine, flourine, bromine, iodine or alkoxy groups with a molar excess of a pyrocarbonate di-substituted with alkyl groups, arylalkyl groups, or phenyl groups to produce a dialkyl, a di(arylalkyl), or a diphenyl diaminohydroquinone-N,N'-dicarboxylate;

oxidizing said hydroquinone to the respective benzoquinone;

reacting said benzoquinone with an aziridine having no substitution on the nitrogen and having substituents on the carbons selected from the group consisting of hydrogen and alkyl; and

recovering the resultant diazirindinyl diaminobenzoquinone-N,N'-dicarboxylate.

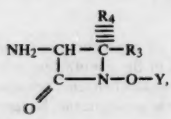
4,337,197

## O-SULFATED β-LACTAM HYDROXAMIC ACIDS AND INTERMEDIATES

Eric M. Gordon, Pennington, and Miguel A. Ondetti, Princeton, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Oct. 31, 1980, Ser. No. 202,830
Int. Cl.³ C07D *205/08;* A61K *31/395;* C07D *403/12, 409/12*
U.S. Cl. 260—239 A 1 Claim

1. A β-lactam having the formula



wherein $R_3$ and $R_4$ are the same or different and each is hydrogen or alkyl and Y is benzyl or pivaloyl.

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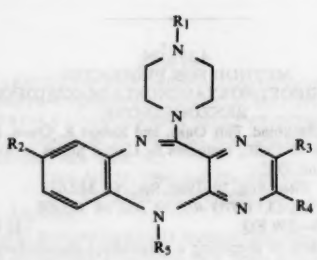
4,337,198

## PYRAZINOBENZODIAZEPINES

Dieter Sorg, Bern, and Albert Leutwiler, Hinterkappelen, both of Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

Filed Apr. 24, 1980, Ser. No. 143,263
Claims priority, application Switzerland, May 11, 1979, 4418/79
Int. Cl.³ C07D *487/02;* A61K *31/495*
U.S. Cl. 260—243.3 25 Claims

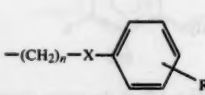
1. A compound of formula I,



I

wherein

$R_1$ is hydrogen, alkyl of 1 to 4 carbon atoms, hydroxyalkyl with a maximum of 4 carbon atoms, the hydroxy group of which may be acylated by an alkanoyl group of 2 to 18 carbon atoms, alkoxyalkyl with a maximum of 6 carbon atoms, cycloalkyl of 3 to 6 carbon atoms, cycloalkylalkyl of 4 to 7 carbon atoms, or a group of formula II,



II

wherein

$R_6$ is hydrogen, halogen, or alkyl or alkoxy of 1 to 4 carbon atoms, and

either

(i) X is —$CH_2$— and n is 0, 1, 2 or 3 or

(ii) X is —CO— and n is 1, 2 or 3 or

(iii) X is —O— and n is 2 or 3,

$R_2$ is hydrogen, halogen, trifluoromethyl or alkyl of 1 to 4 carbon atoms,

$R_3$ is hydrogen, halogen, trifluoromethyl, or alkyl or alkoxy of 1 to 4 carbon atoms,

$R_4$ is hydrogen, or alkyl or alkoxy of 1 to 4 carbon atoms,

and

$R_5$ is hydrogen, alkyl of 1 to 4 carbon atoms or alkenyl of 3 or 4 carbon atoms, with the proviso that, when $R_2$ is hydrogen, $R_5$ is hydrogen,

said compound being in free base or in pharmaceutically acceptable acid addition salt form.

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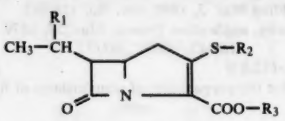
4,337,199

## ANTIBIOTIC β-LACTAM COMPOUNDS, PRODUCTION THEREOF, AND THEIR USE AS ANTIMICROBIAL AGENT

Takeo Yoshioka, Ayase; Kenichi Yamamoto, Fujisawa; Kaoru Yamada, Chigasaki; Yasuyuki Kato, Kawasaki; Yasutaka Shimauchi, Ninomiya, and Tomoyuki Ishikura, Chigasaki, all of Japan, assignors to Sanraku-Ocean Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 90,071, Oct. 31, 1979, abandoned. This application May 6, 1980, Ser. No. 147,146
Claims priority, application Japan, Nov. 1, 1978, 53-133773; Jul. 27, 1979, 54-94891
Int. Cl.³ C07D *487/04;* A61K *31/40*
U.S. Cl. 260—245.2 T 12 Claims

1. A process for producing a compound of the formula



(I)

wherein

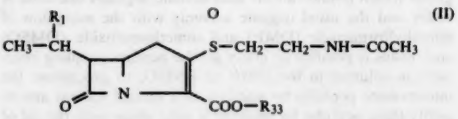
$R_1$ represents hydrogen, methyl or hydroxyl,

$R_2$ represents lower alkyl, hydroxy-lower alkyl, lower alkoxy-lower alkyl, lower alkanoyloxy-lower alkyl, cyclohexyl, phenyl, 2-pyridyl, 3-pyridyl, 4-pyridyl, 2-pyrimidinyl, 4-pyrimidinyl, 5-pyrimidinyl, 2-pyrrolyl, 3-pyrrolyl, 2-imidazolyl or 4-imidazolyl, and

$R_3$ represents hydrogen, lower alkyl or lower alkyl substituted by 1 to 3 phenyl groups which may be substituted by a substituent selected from the group consisting of halogen, lower alkyl, lower alkoxy, lower haloalkyl, nitro and lower alkylsulfonyl,

or its salt,

which comprises reacting a compound of the formula



(II)

wherein

$R_1$ is as defined above, and

$R_{33}$ represents lower alkyl or lower alkyl substituted by 1 to 3 phenyl groups which may be substituted by a substituent selected from the group consisting of halogen, lower alkyl, lower alkoxy, lower haloalkyl, nitro and lower alkylsulfonyl,

with a thiol compound of the formula

$R_2SY$

wherein $R_2$ is as defined above, and Y represents hydrogen or an alkali metal, and, to produce a compound of formula (I) in which $R_3$ is hydrogen, hydrogenolyzing the resulting product, and if desired, converting the resulting product to its salt.

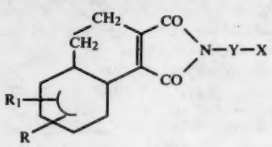
4,337,200

## TRICYCLIC IMIDYL DERIVATIVES

Hans Zweifel, Basel; Walter Schilling, Himmelried; Angelo Storni, Rheinfelden, and Daniel Bellus, Riehen, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 9,985, Feb. 6, 1979, Pat. No. 4,242,264. This application Sep. 4, 1980, Ser. No. 183,905
Claims priority, application Switzerland, Feb. 8, 1978, 1400/78
Int. Cl.[3] C07D *209/90, 209/94*
U.S. Cl. 548—451 5 Claims

1. A compound of formula I



(I)

in which R and $R_1$ independently of one another are hydrogen, halogen, alkyl having 1 to 4 carbon atoms or methoxy, Y is alkylene having 1 to 30 carbon atoms, cycloalkylene having 5 or 6 carbon atoms, methylenebis(cyclohexylene), arylene having 6 to 10 carbon atoms, aralkylene having 7 or 8 carbon atoms or alkylarlylene having 7 or 8 carbon atoms; or said arylene substituted by one alkyl of 1 to 4 carbon atoms, by one alkoxy of 1 to 4 carbon atoms or by one nitro, and X is $—NH_2$ or —NH— alkyl having 1 to 4 carbon atoms.

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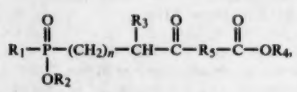
4,337,201

## PHOSPHINYLALKANOYL SUBSTITUTED PROLINES

Edward W. Petrillo, Jr., Pennington, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Dec. 4, 1980, Ser. No. 212,911
Int. Cl.[3] A61K *31/40*; C07D *207/12*
U.S. Cl. 548—413 13 Claims

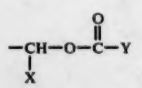
1. A compound having the formula



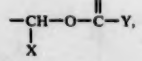
or a salt thereof, wherein

$R_1$ is alkyl, aryl, arylalkyl, cycloalkyl, or cycloalkylalkyl;

one of $R_2$ and $R_4$ is



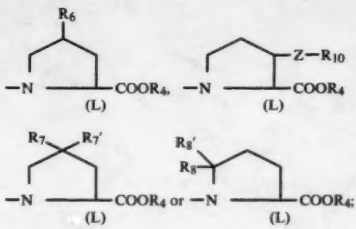
and the other is hydrogen, alkyl, arylalkyl or



wherein X is hydrogen, alkyl or phenyl and Y is hydrogen, alkyl, phenyl or alkoxy, or together X and Y are $—(CH_2)_2—$, $—(CH_2)_3—$, —CH=CH— or

$R_3$ is hydrogen or alkyl;

$—R_5—COOR_4$ is



$R_6$ is hydrogen, hydroxy, alkyl, halogen, azido, amino, cycloalkyl, aryl, arylalkyl, carbamoyloxy, N,N-dialkylcarbamoyloxy, or $—Z—R_9$;

$R_7$ and $R_7'$ are the same and each is halogen or $—Z—R_{10}$, or $R_7$ and $R_7'$ together are =O, $—O—(CH_2)_m—O—$ or $—S—(CH_2)_m—S—$;

$R_8$ is hydrogen and $R_8'$ is phenyl, 2-hydroxyphenyl or 4-hydroxyphenyl or $R_8$ and $R_8'$ together are =O;

$R_9$ is alkyl, aryl, arylalkyl, 1- or 2-naphthyl, or biphenyl;

$R_{10}$ is alkyl, aryl or arylalkyl;

Z is oxygen or sulfur;

n is 0 or 1; and

m is 1 or 2;

and wherein the term "aryl" refers to phenyl or phenyl substituted with halogen, alkyl, alkoxy, alkylthio, hydroxy, alkanoyl, nitro, amino, dialkylamino or trifluoromethyl groups; the term "alkyl" refers to groups having 1 to 10 carbon atoms; the term "alkoxy" refers to groups having 1 to 8 carbon atoms; the term "cycloalkyl" refers to groups having 3 to 7 carbon atoms; and the term "alkanoyl" refers to groups having 2 to 9 carbon atoms.

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4,337,202

## PROCESS OF MAKING L-GULONO GAMMA LACTONE

William M. Hearon, Portland, Oreg., and John F. Witte, Vancouver, Wash., assignors to Boise Cascade Corporation, Boise, Id.

Filed Apr. 16, 1981, Ser. No. 254,925
Int. Cl.[3] C07D *307/32*
U.S. Cl. 549—314 10 Claims

1. The one-step process of making L-gulono gamma lactone which comprises reacting a uronic acid glycoside of the class consisting of polyglucuronic acid and a lower alkyl glucuronoside having from 1–5 carbon atoms in the alkyl group

with hydrogen in an aqueous medium at a pH below about 4 at a reaction temperature of from about 120° to about 140° C. at a pressure of from about 600 to about 1500 p.s.i. in the presence of a periodic table Group VIII noble metal catalyst comprises at least one member of the group consisting of platinum, palladium, ruthenium, rhodium and osmium

for a time sufficent to hydrolyze the glycoside to the corresponding free aldehyde, and to reduce the resulting free aldehyde to L-gulono gamma lactone.

**4,337,203**

## 2,5-INTER-O-PHENYLENE-3,4-DINOR-5,9α-EPOXY PGF$_1$ AMIDES

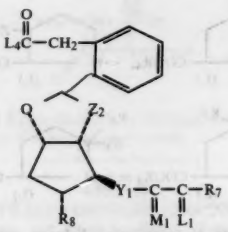
**Udo F. Axen, Plainwell, and John C. Sih, Kalamazoo, both of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.**

**Division of Ser. No. 62,443, Jul. 31, 1979, which is a continuation-in-part of Ser. No. 962,845, Nov. 22, 1978, abandoned. This application Jul. 3, 1980, Ser. No. 165,836**

**Int. Cl.$^3$ C07D *311/00***

**U.S. Cl. 549—396** **2 Claims**

1. A prostacyclin analog of formula V



wherein $Z_2$ is cis—CH=CH— or —$CH_2CH_2$;
wherein $R_8$ is hydrogen, hydroxy, or hydroxymethyl;
wherein $Y_1$ is
(1) trans—CH=CH—,
(2) cis—CH=CH—,
(3) —$CH_2CH_2$, or
(4) —C≡C—,
wherein $M_1$ is α-$R_5$: β—OH or α—OH:β-$R_5$, wherein $R_5$ is hydrogen or alkyl with one to 4 carbon atoms, inclusive,
wherein $L_1$ is α-$R_3$:β-$R_4$, α-$R_4$:β-$R_3$, or a mixture of α-$R_3$:β-$R_4$ and α-$R_4$:β-$R_3$, wherein $R_3$ and $R_4$ are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of $R_3$ and $R_4$ is fluoro only when the other is hydrogen or fluoro;
wherein $R_7$ is
(1) —$(CH_2)_m$—$CH_3$, wherein m is an integer from one to 5, inclusive;
(2) phenoxy;
(3) phenoxy substituted by one, 2 or 3 chloro, fluoro, trifluoromethyl, alkyl of one to 3 carbon atoms, inclusive, or alkoxy of one to 3 carbon atoms, inclusive, with the proviso that not more than two substituents are other than alkyl;
(4) phenyl;
(5) phenyl substituted by one, 2 or 3 chloro, fluoro, trifluoromethyl, alkyl of one to 3 carbon atoms, inclusive, or alkoxy of one to 3 carbon atoms, inclusive, with the proviso that not more than two substituents are other than alkyl;
(6) phenylmethyl, phenylethyl, or phenylpropyl; or
(7) phenylmethyl, phenylethyl, or phenylpropyl substituted by one, 2 or 3 chloro, fluoro, trifluoromethyl, alkyl of one to 3 carbon atoms, inclusive, or alkoxy of one to 3 carbon atoms, inclusive, with the proviso that not more than two substituents are other than alkyl; with the proviso that $R_7$ is phenoxy or substituted phenoxy, only when $R_3$ and $R_4$ are hydrogen or methyl, being the same or different;
wherein $L_4$ is
(1) amino of the formula —$NR_{21}R_{22}$, wherein $R_{21}$ and $R_{22}$ are
(a) hydrogen;
(b) alkyl of one to 12 carbon atoms, inclusive;
(c) cycloalkyl of 3 to 10 carbon atoms, inclusive;
(d) aralkyl of 7 to 12 carbon atoms, inclusive;
(e) phenyl;
(f) phenyl substituted with one, 2 or 3 chloro, alkyl of one to 3 carbon atoms, inclusive, hydroxy, carboxy, alkoxycarbonyl of one to 4 carbon atoms, inclusive, or nitro;
(g) carboxyalkyl of 2 to 5 carbon atoms, inclusive;
(h) carbamoylalkyl of 2 to 5 carbon atoms, inclusive;
(i) cyanoalkyl of 2 to 5 carbon atoms, inclusive;
(j) acetylalkyl of 3 to 6 carbon atoms, inclusive;
(k) benzoylalkyl of 7 to 11 carbon atoms, inclusive;
(l) benzoylalkyl substituted by one, 2 or 3 chloro, alkyl of one to 3 carbon atoms, inclusive, hydroxy, alkoxy of one to 3 carbon atoms, inclusive, carboxy, alkoxycarbonyl of one to 4 carbon atoms, inclusive, or nitro;
(m) pyridyl;
(n) pyridyl substituted by one, 2 or 3 chloro, alkyl of one to 3 carbon atoms, inclusive, or alkoxy of one to 3 carbon atoms, inclusive;
(o) pyridylalkyl of 6 to 9 carbon atoms, inclusive;
(p) pyridylalkyl substituted by one, 2 or 3 chloro, alkyl of one to 3 carbon atoms, inclusive, hydroxy or alkoxy of one to 3 carbon atoms, inclusive;
(q) hydroxyalkyl of one to 4 carbon atoms, inclusive;
(r) dihydroxyalkyl of one to 4 carbon atoms; or
(s) trihydroxyalkyl of one to 4 carbon atoms; with the further proviso that not more than one of $R_{21}$ and $R_{22}$ is other than hydrogen or alkyl;
(2) cycloamino selected from the group consisting of
(a) pyrrolidino,
(b) piperidino,
(c) morpholino,
(d) piperazino,
(e) hexamethyleneimino,
(f) pyrrolino,
(g) 3,4-didehydropiperidinyl, or
(h) pyrrolidino, piperidino, morpholino, piperazino, hexamethyleneimino, pyrrolino, or 3,4-didehydropiperidinyl substituted by one or 2 alkyl of one to 12 carbon atoms, inclusive;
(3) carbonylamino of the formula —$NR_{23}COR_{21}$, wherein $R_{23}$ is hydrogen or alkyl of one to 4 carbon atoms, inclusive, and $R_{21}$ is other than hydrogen, but otherwise as defined above; or
(4) sulfonylamino of the formula —$NR_{23}SO_2R_{21}$, wherein $R_{21}$ and $R_{23}$ are as defined in (3).

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**4,337,204**

## PGI$_2$ LOWER ALKYL ESTERS

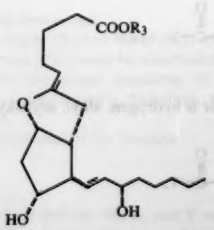
**Roy A. Johnson, Kalamazoo; Frank H. Lincoln, Portage, and John E. Pike, Kalamazoo, all of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.**

**Continuation of Ser. No. 819,940, Jul. 28, 1977, which is a continuation-in-part of Ser. No. 725,550, Sep. 22, 1976, abandoned, which is a continuation-in-part of Ser. No. 716,770, Aug. 23, 1976, abandoned. This application Mar. 27, 1981, Ser. No. 248,637**

**Int. Cl.$^3$ C07D *307/935***

**U.S. Cl. 549—465** **3 Claims**

1. A compound of the formula



or a mixture comprising that compound and the enantiomer thereof, wherein $R_3$ is alkyl of one to 4 carbon atoms, inclusive; including the lower alkanoates thereof.

4,337,205

## NITROGEN CONTAINING ALKOXYSILANE AND PROCESS FOR ITS PRODUCTION

Wolfgang Buder, Rodenbach; Siegfried Wolff, Bornheim-Merten, and Peter Kleinschmit, Hanau, all of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Aug. 28, 1980, Ser. No. 182,313

Claims priority, application Fed. Rep. of Germany, Sep. 1, 1979, 2935454

Int. Cl.³ C07C *117/04, 118/04*

U.S. Cl. 260—349 6 Claims

1. A nitrogen containing alkoxysilane of the formula

$$(RO)_{3-n}(CH_3)_nSi(CH_2)_mNHCON_3$$

in which R is an alkyl group having 1 to 3 carbon atoms, n is 0, 1 or 2 and m is 1, 2 or 3.

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4,337,206

## PROCESS FOR PREPARING HIGH PURITY URSODEOXYCHOLIC ACID

Pietro Gargani, Milan, Italy, assignor to Erregierre S.p.A., Bergamo, Italy

Filed Apr. 29, 1981, Ser. No. 258,730

Claims priority, application Italy, May 14, 1980, 22033 A/80

Int. Cl.³ C07J *9/00*

U.S. Cl. 260—397.1 4 Claims

1. A process for preparing high purity 3α,7β-dihydroxy-cholanic acid from 3α,7α-dihydroxy-$\Delta_{11}$-cholenic acid, comprising

(1) oxidizing the 3α,7α-dihydroxy-$\Delta_{11}$-cholenic acid to 3α-hydroxy-7-keto-$\Delta_{11}$-cholenic acid with an alkaline chromate in a buffered acetic acid solution,

(2) selectively reducing the obtained 7-keto compound with metallic sodium or metallic potassium in an inert organic solvent, at the reflux temperature of the reaction mixture, to 3α,7β-dihydroxy-$\Delta_{11}$-cholenic acid,

(3) reacting this product with a silanising agent in an organic solvent at a temperature between 60° and 100° C. to form the corresponding tris-trimethylsilyl derivative,

(4) hydrolyzing the tris-trimethylsilyl derivative in an aqueous acid solution at a temperature of between 50° C. and 100° C. to obtain the free acid, and

(5) hydrogenating the free acid in an alcoholic solution with a supported Pd catalyst at a temperature of between 50° C. and 100° C. and a pressure of 2–5 atm.

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4,337,207

## BIOLOGICALLY ACTIVE CATECHOLAMINE DERIVATIVES

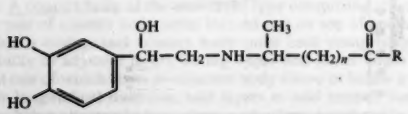
Murray Goodman, La Jolla; Michael S. Verlander, Del Mar; Kenneth A. Jacobson, La Jolla; Kenneth L. Melmon, Woodside, and Neal Castagnoli, San Rafael, all of Calif., assignors to Regents of the University of California, Berkeley, Calif.

Filed Sep. 4, 1980, Ser. No. 184,000

Int. Cl.³ C07C *103/29*

U.S. Cl. 260—404.5 29 Claims

1. β-adrenergic compounds having the formula:



wherein n=1 to 15, and R is NHR′, where R′ is H or an alkyl, aryl, or alkyl-aryl substituent.

4,337,208

## PROCESS FOR THE PRODUCTION OF OIL-SOLUBLE METAL SALTS

Joseph Petronella, Old Bridge Township, Middlesex County, N.J., assignor to Tenneco Chemicals, Inc., Piscataway, N.J.

Filed Feb. 17, 1981, Ser. No. 234,514

Int. Cl.³ C07F *15/02;* C11C *1/00*

U.S. Cl. 260—414 10 Claims

1. In the process for the production of oil-soluble metal salts wherein a reaction mixture that comprises a polyvalent metal, an organic monocarboxylic acid having 5 to 18 carbon atoms, water, and an inert, water-immiscible organic solvent is heated in the presence of oxygen for a period of time sufficient to form the metal salt of said monocarboxylic acid, the improvement wherein the reaction between the polyvalent metal and the monocarboxylic acid is carried out in the presence of an ammonium salt catalyst selected from the group consisting of ammonium salts of mineral acids, ammonium salts of organic monocarboxylic acids having 1 to 4 carbon atoms, and mixtures thereof.

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4,337,209

## PROCESS FOR THE MANUFACTURE OF SOAP

John B. Akers, South Wirral; Jane A. Littler, Warrington, and David C. Peters, Heswall, all of England, assignors to Internationale Octrooi Maatschappij "Octropa" B.V., Rotterdam, Netherlands

Continuation-in-part of Ser. No. 119,225, Feb. 7, 1980, Pat. No. 4,259,251. This application Jan. 16, 1981, Ser. No. 225,623

Claims priority, application United Kingdom, Feb. 14, 1979, 0529/79

Int. Cl.³ C11B *13/00, 1/10*

U.S. Cl. 260—417 8 Claims

1. A process for the preparation of an alkali metal salt of an organic carboxylic acid having from 6 to 24 carbon atoms in the molecule, which process comprises the steps of:

(i) saponifying the corresponding organic carboxylic acid, its ester or mixtures thereof with a concentrated aqueous solution of alkali metal hydroxide in the presence of an inorganic salt of an alkali metal, in a liquid reaction medium comprising acetone;

(ii) separating the organic salts from the reaction medium; and

(iii) removing excess acetone from the organic salt.

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4,337,210

## PROCESS FOR THE PREPARATION OF COBALT (II) ACETYLACETONATE

Hendrikus J. H. van der Maas, Zuilichem, Netherlands, assignor to Chemische Fabriek Zaltbommel, Zaltbommel, Netherlands

Filed Oct. 16, 1980, Ser. No. 197,717

Claims priority, application Netherlands, Oct. 19, 1979, 7907739

Int. Cl.³ C07F *15/06*

U.S. Cl. 260—439 R 10 Claims

1. In a process for the preparation of cobalt (II) acetylacetonate by contacting a cobalt (II) compound with acetylacetone at an elevated temperature, the improvement wherein the reaction is carried out in an organic solvent which is immiscible with water, and forms with water an azeotropic mixture, in the vicinity of the boiling temperature of said azeotropic mixture.

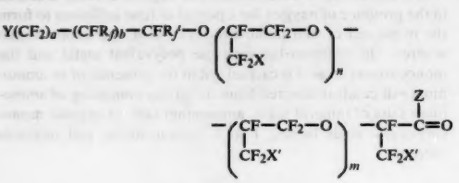
4,337,211

## FLUOROCARBON ETHERS HAVING SUBSTITUTED HALOGEN SITE(S) AND PROCESS TO PREPARE

Bobby R. Ezzell, Lake Jackson; William P. Carl, Angleton, and William A. Mod, Lake Jackson, all of Tex., assignors to The Dow Chemical Company, Midland, Mich.

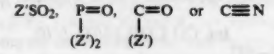
Filed Jun. 11, 1980, Ser. No. 158,428
Int. Cl.[3] C07C *69/67, 143/70*
U.S. Cl. 260—456 F 17 Claims

1. As a composition of matter the compounds represented by the general formula:



where

a=an integer from, and including, 0 to 3;
b=an integer from, and including, 0 to 3;
m=an integer from, and including 0 to 6;
n=an integer from and including 0 to 6;
$R_f$ and $R_f'$ are each independently selected from the group consisting of F, Cl, perfluoroalkyl and fluorochloroalkyl;
X=F, Cl, Br, or mixtures thereof when n>1;
X'=Cl, Br, or mixtures thereof;
Y is selected from the group consisting of



Z' is F, Cl, Br, OH, NRR' or OA
R and R' are independently selected from the group consisting of hydrogen, an alkyl having one or more than one carbon atom and an aryl;
Z=F, Cl, Br, OH, NRR' or OA;
R and R' are independently selected from the group consisting of hydrogen, an alkyl having one or more carbon atom and aryl;
A=alkali metal, quaterary ammonium or R.

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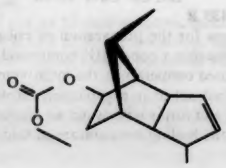
4,337,212

## SUBSTITUTED TRICYCLODECANE DERIVATIVES, PROCESSES FOR PRODUCING SAME AND ORGANOLEPTIC USES THEREOF

Mark A. Sprecker, Sea Bright, and John B. Hall, Rumson, both of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 220,628, Dec. 29, 1980, which is a division of Ser. No. 144,898, Apr. 29, 1980, Pat. No. 4,275,251. This application Sep. 25, 1981, Ser. No. 305,470
Int. Cl.[3] C07C *69/96*
U.S. Cl. 260—463 2 Claims

1. The substituted tricyclodecane derivative defined according to the structure:



4,337,213

## CONTROLLED CRYSTALLIZATION DIPEROXYACID PROCESS

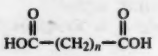
Chester W. Marynowski, Mountain View, and Maria A. Geigel, Menlo Park, both of Calif., assignors to The Clorox Company, Oakland, Calif.

Filed Jan. 19, 1981, Ser. No. 226,241
Int. Cl.[3] C07C *179/15*
U.S. Cl. 260—502 R 19 Claims

1. A method for making a diperoxyacid product comprising the steps of:

providing a liquid and a solid, said liquid and said solid forming a two-phase initial system, said liquid including hydrogen peroxide, sulfuric acid and water, said solid being a diperoxyacid, said solid being in an amount of from about 0.01 wt. % to about 34 wt. % of said two-phase initial system;

feeding a dicarboxylic acid component, a sulfuric acid component, a hydrogen peroxide component, and a water component into said two-phase initial system to form a reaction system, said dicarboxylic acid component being of the formula



wherein n is about 4 to about 18, said reaction system including a reaction solids phase, said reaction solids phase including said solid of said two-phase initial system and diperoxyacid product;

controlling said components being fed during the feeding step to maintain said reaction solids phase at not greater than about 36 wt. % of said reaction system, the controlling including determining a surface area of said reaction solids phase and maintaining a feed rate of said dicarboxylic acid component at a selected value between about 0.1 and about 100 grams per hour per square meter of said surface area.

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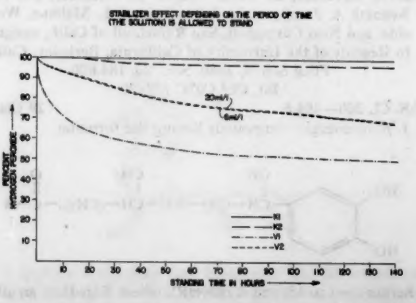
4,337,214

## N-(HYDROXY METHYL)-1-AMINO ALKANE-1,1-DIPHOSPHONIC ACIDS, PROCESS OF MAKING SAME, AND COMPOSITION FOR AND METHOD OF USING SAME AS STABILIZING AGENTS IN PEROXIDE-CONTAINING BLEACHING BATHS

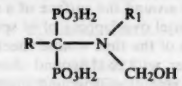
Hans-Adolf Rohlfs, Heidelberg; Alfred Kling, Ladenburg; Guenter Raab, Laudenbach; Michael Vogt, Moerlenbach; Viktor Specht, Dossenheim, and Ulrike Schaetzke, Weinheim-Sulzbach, all of Fed. Rep. of Germany, assignors to Benckiser-Knapsack GmbH, Ladenburg, Fed. Rep. of Germany

Filed Aug. 14, 1980, Ser. No. 177,885
Claims priority, application Fed. Rep. of Germany, Aug. 22, 1979, 2933969
Int. Cl.[3] C07F *9/38*
U.S. Cl. 260—502.5 3 Claims




1. An N-(hydroxy methyl)-1-amino alkane-1,1-diphosphonic

acid or an N,N-Bis-(hydroxy methyl)-1-amino alkane-1,1-diphosphonic acid of the formula



wherein

R indicates methyl, and

$R_1$ indicates hydrogen or the hydroxy methyl group (—$CH_2OH$), and the water-soluble salts of said acid.

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**4,337,215**

**PROCESS FOR PURIFYING 2-ACRYLAMIDO-2-METHYLPROPANESULFONIC ACID**

**Shunichi Doi, and Masatake Kamogawa, both of Yokohama, Japan, assignors to Nitto Chemical Industry Co., Ltd. and Mitsubishi Rayon Co., Ltd., both of Tokyo, Japan**

**Filed Jan. 31, 1979, Ser. No. 8,114**

**Claims priority, application Japan, Feb. 9, 1978, 53-13897**

**Int. Cl.³ C07C *143/02***

**U.S. Cl. 260—513 N** **8 Claims**

1. A process for purifying 2-acrylamido-2-methylpropanesulfonic acid, which comprises dissolving crystals of 2-acrylamido-2-methylpropanesulfonic acid in hydrous acetic acid having a water content of 3 to 80% by weight at 60° to 110° C. and subjecting the resulting solution to recrystallization.

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**4,337,216**

**DEVICE IN AN EVAPORATIVE COOLER**

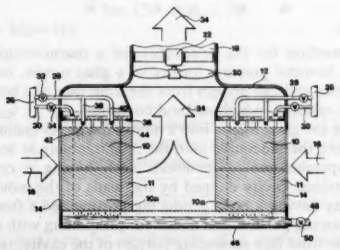
**Lars E. R. Korsell, Stockholm, Sweden, assignor to Aktiebolaget Carl Munters, Sollentuna, Sweden**

**Continuation of Ser. No. 944,248, Sep. 21, 1978, abandoned. This application Jan. 22, 1980, Ser. No. 114,199**

**Claims priority, application Sweden, Sep. 22, 1977, 7710655**

**Int. Cl.³ F28C *1/04***

**U.S. Cl. 261—112** **2 Claims**



1. A contact body of the multilayer type comprising at least one pair of contact body units, located one on top of another within a casing, said contact body units each comprising a plurality of adjacent layers having upper and lower edges at least one of which abuts an adjacent body above or below it in their longitudinal direction, said layers in said contact body units being alternately bent along said edges, transversely to said longitudinal direction, with adjacent bent edge portions of adjacent layers being interconnected, whereby the layers co-operate to define at least two groups of openings in the contact body which communicate only with corresponding openings in an adjacent contact body above or below it, at least one group of openings having the shape of sockets with one socket being telescopically inserted only into another single corresponding opening in an adjacent contact body.

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**4,337,217**

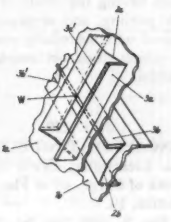
**CONTACTING ARRANGEMENT FOR MASS TRANSFER OPERATIONS AND SET OF PLATES FOR USE IN SAID ARRANGEMENT**

**Roland Braun, Ludwigshafen-Rheingönheim, Fed. Rep. of Germany, assignor to Raschig GmbH, Ludwigshafen am Rhein, Fed. Rep. of Germany**

**Filed Apr. 22, 1981, Ser. No. 256,652**

**Int. Cl.³ B01F *3/04***

**U.S. Cl. 261—112** **15 Claims**



12. In a contacting arrangement for mass transfer operations comprising at least one set of parallel plates which are equally spaced apart and extend at an angle to the horizontal,

the improvement comprised in that:

each of said plates is formed with a plurality of slots, which are arranged in at least two generally parallel rows, which are transversely spaced in the vertical direction,

each of said slots is defined on each side by a lug which can be bent from said plate, and

the longitudinal directions of the slots of adjacent rows of each plate are inclined from the vertical in mutually opposite senses, corresponding lugs of adjacent plates crossing each other to define nips or mixing and imparting turbulence to fluids flowing between said plates.

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**4,337,218**

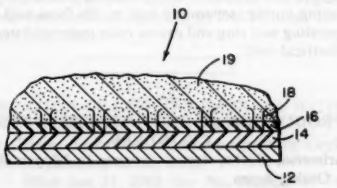
**METHOD OF CASE BONDING PROPELLANT**

**James D. Byrd, Huntsville, Ala., and Lamar Field, Nashville, Tenn., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.**

**Filed Oct. 15, 1980, Ser. No. 197,035**

**Int. Cl.³ C06B *21/00, 45/10***

**U.S. Cl. 264—3 R** **10 Claims**



1. A mechanical method of case bonding a solid propellant to a rocket motor case to achieve an improved propellant bond to case strength, said method comprising:

(i) applying a layer of an uncured liner composition to the internal surface of a rocket motor case;

(ii) embedding a mechanical structural material that is compatible with said liner formulation and the solid propellant composition which is to be cast against said uncured liner composition after said liner composition is cured with a portion of said mechanical structural material protruding above said cured liner composition, said mechanical structural material being in a predetermined form in said uncured liner composition and allowing a portion of said mechanical structural material to protrude above said uncured liner composition;

(iii) curing said liner composition;

(iv) casting a solid propellant composition against the cured liner composition and around said protruding portion of mechanical structural material; and,

(v) curing said solid propellant composition to yield a solid propellant grain that is characterized by an improved propellant bond to case strength, said propellant bond to case strength being further characterized by said solid propellant grain having the mode of failures due to low shear strength, peeling, and separations which are lessened as compared with a similarly case bonded solid propellant grain which does not employ said mechanical structural material.

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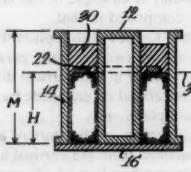
**4,337,219**

## METHOD OF ENCAPSULATING ELECTRICAL COILS

**Paul P. Falkowski, Clearwater; Erwin Spotz, and Mangesh Rajadhyaksha, both of Largo, all of Fla., assignors to Square D Company, Palatine, Ill.**

**Filed Dec. 9, 1980, Ser. No. 214,619**
**Int. Cl.³ B29C 6/02**
**U.S. Cl. 264—130** **8 Claims**




1. A method of forming a cast resin electrical coil comprising the steps of inserting a wound induction element around an inner mold; positioning an outer mold having a closed bottom around said inner mold for forming a space therebetween; coating a ring with a layer of release material; positioning said ring between said inner and outer molds and spaced from the closed bottom; providing communication between the spaces on opposite sides of said ring, introducing a liquid cast resin material between said molds to fill the space between said bottom and said ring and with excess resin material above said ring; curing said resin material and allowing said excess resin material to flow from above said ring into the space between said ring and said bottom to accommodate for shrinking of said resin during curing; separating said molds from said material; and separating said ring and excess resin material from the case resin electrical coil.

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**4,337,220**

## PRODUCTION OF PHOTOSENSITIVE RESIN CYLINDERS

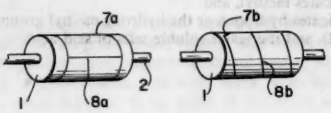
**Seiji Arimatsu, Osaka, Japan, assignor to Nippon Paint Co., Ltd., Osaka, Japan**

**Continuation of Ser. No. 24,040, Mar. 26, 1979, abandoned. This application Nov. 4, 1980, Ser. No. 203,888**
**Claims priority, application Japan, Mar. 29, 1978, 53-37084**
**Int. Cl.³ B29C 27/02**
**U.S. Cl. 264—25** **5 Claims**

1. A process for producing a photosensitive resin cylinder of the type including a cylinder having applied to the surface thereof a smooth and uniform thickness layer of photosensitive resin material, said process comprising:

winding a photosensitive resin sheet having a thickness of from 1 to 4 mm on and around the surface of a cylinder without allowing any material overlapping of or spaces between the side edge portions of the thus wound sheet;

rotating said cylinder with said wound sheet thereon while contacting the surface of said wound sheet with a roll and causing said roll to rotate against said surface, and simultaneously applying heat in a single direction from an external infrared heater to said wound sheet, thereby joining said side edge portions of said wound sheet by melting, the amount of heat thus applied being sufficient to soften said wound sheet without causing said resin material to flow; and




continuing said rotation of said cylinder while cooling said wound sheet, thus forming said wound sheet into a photosensitive resin layer having a uniform thickness of from 1 to 4 mm and a smooth outer surface.

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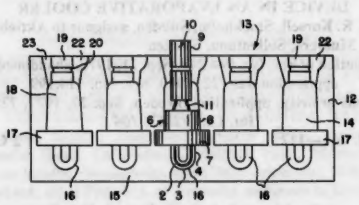
**4,337,221**

## METHOD OF MAKING THERMOCOUPLES AND PRODUCTS THEREOF

**Adrian L. Gray, 3 Kruger Dr., Craighall Park, Johannesburg, Transvaal Province, South Africa**

**Continuation-in-part of Ser. No. 870,663, Jan. 19, 1978, Pat. No. 4,241,003**
**Filed May 29, 1979, Ser. No. 43,489**
**The portion of the term of this patent subsequent to Jan. 19, 1995, has been disclaimed.**
**Int. Cl.³ B29C 6/04, 1/02**
**U.S. Cl. 264—102** **9 Claims**




2. A method for the production of a thermocouple unit having a bi-metal junction located in a glass u-tube, having a pair of open ends, to project from the front face of a body of a ceramics material, which method comprises,

placing the glass u-tube into a mould for use in manufacturing the thermocouple unit, the mould having at least two co-operable mould members, each having a centrally positioned cavity defined by the walls of the mould, the cavity having a body producing portion and a front face producing portion, and means for positioning with respect to the front face producing portion of the cavity, the glass u-tube, such that both open ends of the glass u-tube are positioned within the body producing portion of the mould, and such that the bend of the u-tube is positioned outside of the body producing portion of the mould at a selected distance,

closing the mould members onto each other,

opening the mould and removing the contents therefrom, after the contents have at least partially cured,

heating the contents to a temperature sufficient to anneal the bi-metal junction,

replacing the contents back into the cavity of the mould,

positioning additional non-ceramic components into the cavity of the mould, and

introducing additional ceramics material into the cavity of the mould thereby producing a finished thermocouple unit.

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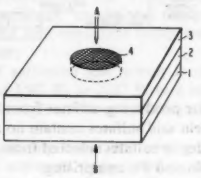
## 4,337,222
## HEMOGLOBIN CONCENTRATION DETERMINING ARTICLE

**Masao Kitajima; Fuminori Arai, and Asaji Kondo, all of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan**

**Filed Jan. 7, 1981, Ser. No. 223,052**
**Claims priority, application Japan, Jan. 7, 1980, 55-435**
**Int. Cl.³ G01N *33/72***
**U.S. Cl. 422—56** **11 Claims**




1. A hemoglobin concentration-determining article comprising a water-impermeable support having integrally provided thereon, in sequence, a hydrophilic binder layer and a porous spreading layer which has a hydrophilic surface and in which the surface of the internal voids or the interior is hydrophilic and water-insoluble, said porous spreading layer being constituted so that an aqueous sample applied thereto can be spread and incorporated therein in a substantially definite volume per unit area, wherein the porous spreading layer comprises a non-fibrous porous material having a mean pore diameter of about 2.5 μm to about 500 μm or a fibrous porous material having a yarn number count of from about 40 to about 100.

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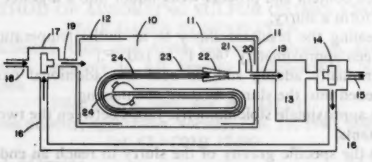
## 4,337,223
## STERILIZING APPARATUS INCORPORATING RECIRCULATION OF CHAMBER ATMOSPHERE

**Saul Kaye, Evanston, Ill., assignor to Ben Venue Laboratories, Inc., Bedford, Ohio**

**Filed Feb. 13, 1981, Ser. No. 212,972**
**Int. Cl.³ A61L *2/20***
**U.S. Cl. 422—112** **8 Claims**




1. In apparatus for sterilization of a medical instrument having passages therein comprising a sterilizing chamber and temperature-control means therefor, the improvement which comprises means for disposing a sterilant gas within said sterilizing chamber, means for circulating said sterilant gas within said sterilizing chamber, means for recirculating said sterilant gas through a medical instrument having passages therein and positioned totally within said sterilizing chamber, means for circulating a desorbing gas through said passages in said medical instrument, and pressure-control means for said sterilizing chamber, wherein said means for recirculating said sterilant gas through said passages in said medical instrument consists of a valve and a recirculating pump.

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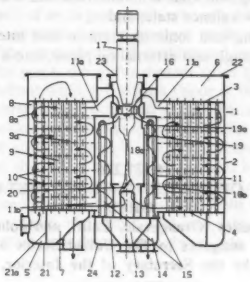
## 4,337,224
## APPARATUS FOR CONDUCTING THE CATALYTIC OXIDATION OF GASEOUS SULFUR COMPOUNDS TO SULFUR TRIOXIDE

**Friedrich Mahler, Cologne, and Adolf Stauffer, Pulheim, both of Fed. Rep. of Germany, assignors to Davy McKee Aktiengesellschaft, Cologne, Fed. Rep. of Germany**

**Filed Feb. 23, 1981, Ser. No. 237,211**
**Claims priority, application Fed. Rep. of Germany, Feb. 23, 1980, 3006900**
**Int. Cl.³ B01J *8/06***
**U.S. Cl. 422—197** **9 Claims**




1. In an apparatus for conducting the catalytic oxidation of gaseous sulfur compounds to sulfur trioxide comprising a reactor housing containing a plurality of tubes arranged between tube plates, said housing having domes at each end for feeding, guiding, and discharging the reaction gas to and from individual tube groups, at least a portion of said tubes containing a catalyst therein, and all of said tubes arranged for being surrounded and contacted by the flow of a liquid heat-transport agent, the improvement comprising:

an outer zone (**8**) having empty tubes (**8***a*) arranged therein between an upper tube plate (**3**) and a lower tube plate (**4**);

an intermediate zone (**9**) adjacently adjoining said outer zone (**8**) toward the interior of the housing, and having catalyst filled tubes (**9***a*) arranged therein;

wall means (**11**) defining an inner chamber (**18***a*, **18***b*) and separating said inner chamber (**18***a*, **18***b*) from said intermediate zone, said wall means (**11**) having upper openings (**11***a*) and lower openings (**11***b*) for allowing passage of the heat transport agent therethrough;

plate means (**10**) common to both the outer zone (**8**) and the intermediate zone (**9**) for guiding the flow of the heat transport agent cross-currently around and in contact with empty tubes (**8***a*) and catalyst-filled tubes (**9***a*); and

axial flow pump means (**16**) arranged in said inner chamber for causing the heat transport-agent to circulate throughout the outer and intermediate zones (**8**, **9**) and through the inner chambers (**18***a*, **18***b*).

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## 4,337,225
## REGENERATION OF LIQUID MEMBRANE WITHOUT BREAKING EMULSION

**Martin B. Dines, Santa Ana, Calif., assignor to Occidental Research Corporation, Irvine, Calif.**

**Filed Jan. 21, 1980, Ser. No. 113,852**
**Int. Cl.³ C01G *43/00***
**U.S. Cl. 423—10** **29 Claims**

28. A process for removing uranium ions from an aqueous solution containing said uranium ions in the +4 valence state which comprises the steps of:

(a) contacting said aqueous solution containing ionic ura-

nium in the +4 valence state with an oil-in-water emulsion, said oil-in-water emulsion having an oil external phase which is permeable to ionic uranium in the +4 valence state and impermeable to ionic uranium ions when in a +6 valence state, said external oil phase surrounding an internal first aqueous phase including a reagent which is capable of reversibly converting ionic uranium from the +4 valence state to a +6 valence state, said reagent selected from the group consisting of $Fe^{+3}$, $I_2$ and quinone;

(b) permeating said ionic uranium in the +4 valence state, through said external oil phase, into said internal aqueous phase;

(c) converting said ionic uranium in said internal aqueous phase by means of such reagent into the +6 valence state;

(d) separating said emulsion from said aqueous solution;

(e) converting said ionic uranium from said +6 valence state to said +4 valence state; and

(f) permeating said ionic uranium in said internal aqueous phase, through said external oil phase, into a second aqueous phase.

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## 4,337,226
## RECOVERY OF PLATINUM-GROUP METALS FROM ORES

**Edward R. Peasley, Orangevale, Calif., and John M. Gomes, Reno, Nev., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.**

**Filed Feb. 11, 1981, Ser. No. 233,422**
**Int. Cl.³ C01G *55/00, 53/10, 3/10, 7/00***
**U.S. Cl. 423—22** **2 Claims**

1. A process for recovery of nickel, iron, platinum, palladium, copper and gold values from ore concentrates consisting essentially of

(a) smelting the concentrate with a flux to form a matte and slag;

(b) dry grinding the matte to a particle size suitable for leaching;

(c) leaching, in a first-stage leach, the ground matte with sulfuric acid of a concentration of about 15 to 25 weight percent at a temperature of about 90 to 100° C. and at atmospheric pressure to selectively extract nickel and iron values, and

(d) leaching, in a second-stage leach, the residue from the first-stage leach with a leach solution comprising sulfuric acid of a concentration of about 20 to 30 weight percent and sodium hypochlorite or hydrogen peroxide, at a temperature of about 90° to 100° C. and at atmospheric pressure, to extract platinum, palladium, copper and gold values.

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## 4,337,227
## RECOVERY OF CHROMIUM FROM WASTE SOLUTIONS

**Hector O. McDonald, and Lawrence C. George, both of Rolla, Mo., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.**

**Filed Sep. 10, 1981, Ser. No. 300,834**
**Int. Cl.³ C01G *37/02***
**U.S. Cl. 423—55** **3 Claims**

1. A process for recovery of chromium from waste solutions comprising:

(a) reducing any $Cr^{+6}$ in the solution to $Cr^{+3}$,

(b) adjusting the pH of the solution to about 3 to 4,

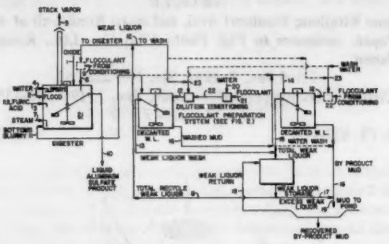
(c) treating the solution with sodium benzoate, or a mixture of sodium and ammonium benzoates, to precipitate the chromium as a benzoate complex, and

(d) separating the precipitate from the solution.

## 4,337,228
## PROCESS FOR THE PRODUCTION OF SULFATES

**Luther W. Garrett, Jr., San Mateo, Calif., assignor to Alumax, Inc., San Mateo, Calif.**

**Continuation-in-part of Ser. No. 181,098, Aug. 25, 1980, abandoned. This application Jun. 8, 1981, Ser. No. 271,558**
**Int. Cl.³ C01F *7/74, 7/76***
**U.S. Cl. 423—114** **14 Claims**




1. A process for producing sulfates from by-product aluminum oxide wherein said sulfates contain no appreciable heavy metals, their oxides or sulfates selected from the group consisting of Cu, Cr, Mn and Pb comprising:

A. feeding the aluminum oxide by-product and process-weak liquor into a digester vessel to form a slurry;

B. heating the resulting slurry to an initial temperature between approximately 140° F. to 160° F.;

C. gradually adding sulfuric acid and additional oxide as needed into the slurry mixture maintaining:

(1) approximate stoichiometric ratios between the two reactants;

(2) the specific gravity of the slurry to reach an end point of between approximately 1.400 to 1.4700;

(3) the pH of the slurry between approximately 1.3 to 1.9; and

(4) the temperature of the reaction below approximately 220° F.;

D. continuing to allow the oxides and acid to react for between approximately 3 to 5.5 hours at approximately atmospheric pressure; and

E. removing the product.

12. A process for producing the binary salt aluminum ammonium sulfate and liquid aluminum sulfate wherein said binary salt contains no appreciable heavy metals, their oxides or sulfates selected form the group consisting of Cu, Cr, Mn and Pb comprising:

A. feeding the aluminum oxide by-product having a high nitride content and process-weak liquor into a digester vessel to form a slurry;

B. heating the resultant slurry to an initial temperature between approximately 140° F. to 160° F.;

C. gradually adding sulfuric acid and additional oxide as needed into the slurry mixture maintaining:

(1) approximate stoichiometric ratios between the two reactants;

(2) the specific gravity of the slurry to reach an end point between approximately 1.400 to 1.4700;

(3) the pH of the slurry between 1.3 to 1.9; and

(4) the temperature of the reaction below approximately 220° F.;

D. after the reaction has gone substantially to completion, adding flocculant and allowing the mixture to at least partially settle;

E. submerging a device having a cool surface area into the vessel containing the product mixture;

F. crystallizing the binary salt on the cool surface;

G. removing the device having a cool surface and removing, washing and stripping the crystals; and

H. decanting the supernatent liquid aluminum sulfate product liquor.

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4,337,229

## TREATMENT OF FLUE GASES

Aaron J. Teller, Westboro, Mass., assignor to Teller Environmental Systems, Inc., Worcester, Mass.

Filed Dec. 8, 1980, Ser. No. 214,134
Int. Cl.[3] C01B *17/16, 31/20, 17/00;* B01J *8/00*
U.S. Cl. 423—225 12 Claims

1. A process for treating an effluent gas containing entrained particulates, hydrogen sulfide, organic sulfur compounds, and sulfur dioxide, said gas having a temperature above 150° F., which includes:

(a) initiating nucleation of the particulates in a first enclosure by treating the gas to increase its turbulence and to increase its humidity substantially to saturation at a wet bulb temperature above about 150° F. to about 185° F. under substantially adiabatic conditions, the pressure drop of said gas in said first enclosure being less than about 15 inches of water;

(b) passing said saturated gas which is at a temperature between about 150° F. to 212° F. in a substantially horizontal path through a second enclosure containing packing;

(c) passing a scrubbing liquor comprising an aqueous alkaline slurry of activated oxygenated carbon downwardly over said packing under laminar flow conditions;

(d) exhausting said gas from said second enclosure;

(e) collecting a first portion of said liquor after passage through said packing and recirculating said first portion through said packing, said portion containing at least about 15% and less than saturation non-volatile material by weight;

(f) passing a second portion of said liquor as a liquid stream to the first enclosure to recover particulates and a portion of the hydrogen sulfide, organic sulfur compounds and $SO_2$;

(g) increasing the concentration of solids in the liquid stream of step (f) in said first enclosure to approximately 0.5–5% above saturation concentration of the materials to be recovered;

(h) providing an environment in the first enclosure for agglomeration of the suspended solids to promote rapid separation of the liquid and suspended solids;

(i) recycling in the first enclosure one portion of the bottoms with a solids concentration of from 0.5–5% above saturation concentration; and,

(j) concentrating another portion of the bottoms from the first enclosure to a 40–60% total solids mix.

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4,337,230

## METHOD OF ABSORBING SULFUR OXIDES FROM FLUE GASES IN SEAWATER

Arne Ellestad, Oslo, and Arvid Tokerud, Lillestrom, both of Norway, assignors to AB Svenska Fläktfabriken, Nacka, Sweden

Filed Feb. 6, 1981, Ser. No. 232,017
Claims priority, application Norway, Feb. 13, 1980, 800385
Int. Cl.[3] C01B *17/00*
U.S. Cl. 423—242 9 Claims

1. A method of absorbing sulfur oxides from flue gases by contacting said flue gases with seawater, said method comprising using seawater for said absorption of sulfur oxides in an amount such that subsequent to said absorption the pH of said seawater is from 1.8 to 3.3, treating said seawater after absorbing said sulfur oxides with a calcium based alkali chosen from the group consisting of CaO, $Ca(OH)_2$, and $CaCO_3$, in an amount such that the pH of said sulfur oxide-containing seawater is greater than 5.2, subjecting said seawater to a reactor into which an oxygen-containing gas is fed whereby said sulfur oxides are oxidized and carbon dioxide is stripped from said seawater, and adjusting the pH of said decarbonated and oxidized seawater subsequent to said decarbonation-oxidation reactor to above 5.5 by addition to said seawater of calcium based alkali selected from the group consisting of CaO, $Ca(OH)_2$, and $CaCO_3$.

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4,337,231

## REMOVAL OF SULFUR DIOXIDE FROM EXHAUST GAS

Kunihide Yaguchi; Masakazu Takaiwa, and Minoru Aoki, all of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 64,638, Aug. 7, 1979, Pat. No. 4,269,806.
This application Nov. 17, 1980, Ser. No. 207,780
Int. Cl.[3] C01B *17/00*
U.S. Cl. 423—243 5 Claims

1. A method of removing sulfur dioxide from an exhaust gas containing the sulfur dioxide by using an aqueous absorbent containing a salt of an organic acid, wherein the exhaust gas is brought into counter-current contact with said absorbent within a scrubber provided with multistaged perforated plates to substantially scrub the sulfur dioxide from the exhaust gas into said absorbent while releasing a vapor of the organic acid from said absorbent, characterized in that the scrubber is provided with wetted walls on the top of the perforated plates and said absorbent adjusted to a pH of 7 to 8 is introduced into the scrubber from the top of the wetted walls to be brought into contact with the vapor of organic acid discharged from the top of the perforated plates within the wetted walls with a result of absorbing the vapor of organic acid into said absorbent and then the resulting absorbent flows down into the perforated plates.

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4,337,232

## AMMONIA SYNTHESIS PROCESS USING MOLYBDENUM OXYCARBONITRIDE CATALYST

Larry E. McCandlish, Highland Park, and Edwin L. Kugler, Summit, both of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Mar. 16, 1981, Ser. No. 243,824
Int. Cl.[3] C01C *1/04*
U.S. Cl. 423—362 7 Claims

1. A process for synthesizing ammonia comprising contacting a gaseous mixture of hydrogen and nitrogen, in a 1:3 to 10:1 volume ratio, respectively, with a catalyst comprised of molybdenum oxycarbonitride, at a temperature in the range of about 300° to 500° C., a pressure of about 0.1 to 20 MPa, and a space velocity of about 1000 to 60,000 v/v/hr., thereby resulting in product ammonia.

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4,337,233

## PREPARATION OF STRONTIUM NITRATE FROM CELESTITE AND CALCIUM NITRATE

John S. Chiang, Mercerville, and David Goldstein, East Brunswick, both of N.J., assignors to FMC Corporation, Philadelphia, Pa.

Filed Jun. 12, 1981, Ser. No. 273,282
Int. Cl.[3] C01F *11/40*
U.S. Cl. 423—397 16 Claims

1. The process of preparing strontium nitrate from celestite ore which comprises

(a) mixing ground celestite ore with greater than a stoichiometric quantity of calcium nitrate in an aqueous reaction mixture to react strontium sulfate in the celestite with calcium nitrate, the reaction mixture containing insufficient water to solubilize all strontium values in the celestite as strontium nitrate;

(b) contacting the reaction mixture, quickly and with vigorous agitation, with additional water to rapidly dissolve and extract soluble strontium nitrate reaction product, the total quantity of added water and reaction mixture water being from 100 to 140% of the amount required to solubilize essentially all of the strontium nitrate in the reaction mixture;

(c) separating the aqueous solution containing solubilized strontium nitrate and unreacted calcium nitrate from the undissolved reaction mixture solids;
(d) evaporating water from the separated aqueous solution to induce crystallization of strontium nitrate; and
(e) recovering the strontium nitrate.

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**4,337,234**

## METHOD FOR PREPARING SODIUM BICARBONATE AND HYDROGEN CHLORIDE

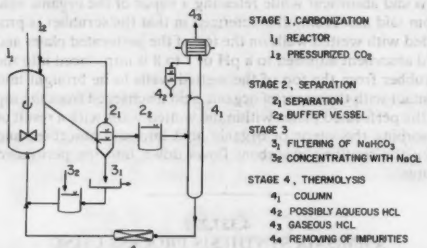
**Bernhard Hentschel; Jürgen Ziebarth, both of Marl; Alfred Coenen, Maria Laach; Kurt Kosswig, Marl, and Ferdinand von Praun, Haltern, all of Fed. Rep. of Germany, assignors to Chemische Werke Hüls AG, Marl, Fed. Rep. of Germany**

**Filed Oct. 3, 1980, Ser. No. 193,591**

**Claims priority, application Fed. Rep. of Germany, Oct. 6, 1979, 2940628; Aug. 19, 1980, 3031213**

**Int. Cl.³ C01D *7/10*; C01B *7/08***

**U.S. Cl. 423—424** **18 Claims**




1. In a method for producing sodium bicarbonate and hydrogen chloride by reacting an aqueous sodium chloride solution with carbon dioxide in the presence of an amine and an organic solvent, the improvement comprising:
(a) introducing said carbon dioxide under pressure into a mixture comprising
(A) said aqueous sodium chloride solution,
(B) said amine comprising a tertiary amine,
(C) said organic solvent comprising at least one polar, organic solvent having a boiling point above 140° C.;
(D) said organic solvent comprising at least one non-polar, organic solvent,
to produce an aqueous phase and at least one organic phase;
(b) separating said aqueous phase and said organic phase under the same pressure as step (a);
(c) separating said sodium bicarbonate from said aqueous phase, reconcentrating said separated aqueous phase with sodium chloride and feeding back said reconcentrated aqueous phase into step (a);
(d) separating said hydrogen chloride from said organic phase containing said non-polar organic solvent and said polar, organic solvent by heating, and said amine; and
(e) recirculating said amine and said polar and non-polar organic solvents to step (a).

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**4,337,235**

## PURIFICATION OF THIONYL CHLORIDE

**Joseph S. Wisnouskas, and Joseph J. Moritz, both of Grand Island, N.Y., assignors to Hooker Chemicals & Plastics Corp., Niagara Falls, N.Y.**

**Filed Apr. 28, 1981, Ser. No. 258,498**

**Int. Cl.³ C01B *17/45***

**U.S. Cl. 423—468** **5 Claims**

1. A process for the recovery of thionyl chloride from its admixture with impurities including sulfuryl chloride, sulfur monochloride and sulfur dichloride, said process comprising fractionally distilling said mixture in the presence of sulfur so that a mixture of thionyl chloride, sulfuryl chloride, sulfur dichloride and sulfur is distilled, said distillate in a vapor state passing through a bed of sulfur-aluminum chloride particles and reflux vapors containing sulfur-aluminum chloride to convert the sulfuryl chloride to sulfur dioxide, chlorine and sulfur monochloride, and sulfur dichloride to sulfur monochloride, conducting the sulfur monochloride to said mixture being distilled, taking off the purified distilled thionyl chloride, substantially free of sulfuryl chloride, sulfur dichloride and sulfur monochloride.

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**4,337,236**

## PROCESS FOR MANUFACTURE OF CALCIUM HYPOCHLORITE

**Walter J. Sakowski; John H. Shaffer, and Larry G. Carty, all of Cleveland, Tenn., assignors to Olin Corporation, New Haven, Conn.**

**Filed Aug. 7, 1980, Ser. No. 176,173**

**Int. Cl.³ C01B *11/06***

**U.S. Cl. 423—474** **9 Claims**

1. A process for the production of granular calcium hypochlorite compositions which comprises:
(a) reacting neutral calcium hypochlorite with an alkaline solution comprised of an alkali metal hypochlorite and an alkali metal hydroxide, the concentration of said alkali metal hypochlorite being from about 20 to about 32 percent by weight and the concentration of said alkali metal hydroxide being from about 2 to about 20 percent by weight, to produce a slurry comprised of neutral calcium hypochlorite and a residual amount of hemibasic calcium hypochlorite, and
(b) recovering a wet cake of said neutral calcium hypochlorite and said residual amount of hemibasic calcium hypochlorite and drying said wet cake to produce granular calcium hypochlorite compositions, comprised of said neutral calcium hypochlorite and from about 10 to about 20 percent by weight of hemibasic calcium hypochlorite.

4. A process for the production of granular calcium hypochlorite compositions which comprises:
(a) reacting a chlorinated lime slurry comprised of calcium hypochlorite and calcium chloride with a slurry of triple salt crystals, and an alkaline solution comprised of an alkali metal hypochlorite and an alkali metal hydroxide to produce a calcium hypochlorite slurry comprised of neutral calcium hypochloride, sodium chloride, and a residual amount of hemibasic calcium hypochlorite, and
(b) recovering a wet cake of said neutral calcium hypochlorite, said sodium chloride, and said residual amount of hemibasic calcium hypochlorite and drying said wet cake to produce granular calcium hypochlorite compositions comprised of said neutral calcium hypochlorite and having from about 10 to about 20 percent by weight of said hemibasic calcium hypochlorite.

8. The process of claims 4 or 6 in which said chlorinated lime slurry has an active residual alkalinity content of less than 0.2 percent by weight.

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**4,337,237**

## CATALYTICALLY INCREASING THE OBTAINABLE CONCENTRATION OF HALOGEN IN WATER

**Thomas G. Hart, Royal Oak, Mich., assignor to Energy Development Associates, Inc., Madison Heights, Mich.**

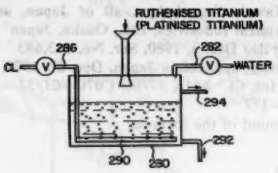
**Division of Ser. No. 56,915, Jul. 12, 1979, which is a division of Ser. No. 925,980, Jul. 19, 1978, Pat. No. 4,182,662. This application Sep. 10, 1980, Ser. No. 185,891**

**Int. Cl.³ C01B *7/01***

**U.S. Cl. 423—486** **2 Claims**

1. A chemical catalytic method of concentrating a halogen in a body of water, said method comprising the steps of:

(a) adding to said water body uncharged particles of catalyst selected from the class consisting of graphitized carbon,




ruthenised titanium, platinised titanium and mixtures thereof;

(b) bubbling said halogen through said body of water.

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**4,337,238**

## METHOD OF GROWTH OF PRIMARY ANHYDRITE CRYSTALS UNDER MODERATE CONDITIONS

**Robert D. F. Cody, Ames, Iowa, and Amy B. Hull, Downers Grove, Ill., assignors to Iowa State University Research Foundation, Inc., Ames, Iowa**

**Filed May 18, 1981, Ser. No. 264,595**

**Int. Cl.³ C01F *11/46***

**U.S. Cl. 423—555** **12 Claims**

1. A method of selectively forming anhydrite crystals to the predominant exclusion of formation of gypsum and bassanite, said method comprising:

obtaining an aqueous solution of a calcium salt;

obtaining an aqueous solution of a sulfate sale;

adding to at least one of said aqueous solutions a small but effective amount of a selective crystallization inhibitor selected from the group of polymaleic acid, polyacrylic acid and organo-phosphate esters, which inhibit the formation of gypsum crystals, but does not interfere with formation of anhydrite; and

slowly mixing said aqueous solutions at a temperature within the range of from about 60° C. to about 80° C. which will prevent the formation of bassanite while maintaining the pH above 3.5 but below 11.5.

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**4,337,239**

## PROCESS FOR THE PRODUCTION OF TITANIUM DISULFIDE OF HIGH PURITY AND STOICHIOMETRIC COMPOSITION

**Alexander Ruhs, Rheinfelden; Rudolf Schwarz, Alzenau-Wasserlos, and Peter Kleinschmit, Hanau, all of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany**

**Filed Nov. 10, 1980, Ser. No. 205,505**

**Claims priority, application Fed. Rep. of Germany, Nov. 9, 1979, 2945306**

**Int. Cl.³ C01B *7/01, 17/20;* C01G *23/00***

**U.S. Cl. 423—561 R** **9 Claims**

1. In a process for the production of titanium disulfide of high purity and stoichiometric composition by reacting preheated gaseous titanium tetrachloride with an excess of preheated gaseous hydrogen sulfide in a heated vertical reactor at a temperature of 400° to 600° C., the improvement comprising introducing the titanium tetrachloride and hydrogen sulfide into the lower third of the reactor, regulating the temperature on the reactor wall and/or the residence time of the gaseous mixture in the reactor to force a nearly complete deposition of the titanium disulfide formed on the inner wall of the reactor, mechanically stripping the deposited titanium disulfide from the reactor inner wall and removing the titanium disulfide from the lower end of the reactor in countercurrent flow to the waste gas stream, said waste gas stream leaving the reactor at the upper end thereof.



**4,337,240**

## DENATURED ALBUMIN COMPLEXES FOR RADIOSCINTIGRAPHIC IMAGING AND EVALUATION OF RETICULOENDOTHELIAL SYSTEMS

**Eugene L. Saklad, Sudbury, Mass., assignor to New England Nuclear Corporation, Boston, Mass.**

**Continuation-in-part of Ser. No. 898,292, Apr. 20, 1978, Pat. No. 4,226,846. This application Mar. 7, 1979, Ser. No. 18,312**

**The portion of the term of this patent subsequent to Oct. 7, 1997, has been disclaimed.**

**Int. Cl.³ A61K *49/00, 43/00;* C07G *7/00***

**U.S. Cl. 424—1** **60 Claims**

1. A composition for labelling with $^{99m}Tc$ for radioactive imaging comprising complexes of denatured albumin and a reducing metal, at least a major portion of which having a particle size of less than about 0.2 μm.

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**4,337,241**

## EMULSIONS OF THE WATER-IN-OIL OR OIL-IN-WATER TYPE AND COSMETIC PRODUCTS USING THESE EMULSIONS

**Jean-Claude Ser, Beynes; Arlette Zabotto, Paris; Christian Zaffran, Elancourt, and Constantin Koulbanis, Paris, all of France, assignors to L'Oreal S.A., Paris, France**

**Filed Feb. 17, 1978, Ser. No. 878,912**

**Claims priority, application France, Feb. 23, 1977, 77 05258**

**Int. Cl.³ A61K *7/42, 7/021, 31/00***

**U.S. Cl. 424—59** **21 Claims**

1. A stable emulsion of the "water-in-oil" or "oil-in-water" type comprising an aqueous phase, an oil phase and an emulsifier which is a mixture of lanolin acid and at least one natural basic α-amino-acid.

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**4,337,242**

## VACCINE STABILIZER CONTAINING L-GLUTAMIC ACID AND L-ARGININE

**Henry Z. Markus, Wyncote, and William J. McAleer, Ambler, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.**

**Continuation of Ser. No. 118,703, Feb. 5, 1980, abandoned, which is a continuation-in-part of Ser. No. 89,068, Oct. 29, 1979, abandoned. This application Mar. 10, 1981, Ser. No. 242,195**

**Int. Cl.³ A61K *39/12, 39/165, 39/13, 39/245***

**U.S. Cl. 424—89** **6 Claims**

1. A liquid vaccine comprising an inactivated or attenuated virus and a stabilizer consisting essentially of on a parts by weight basis from about 1.5 to about 2.1 parts partially hydrolyzed gelatin having a molecular weight of about 3,000, from about 7.0 to about 13.0 parts of a monosaccharide or disaccharide from about 0.4 to about 0.6 parts of an in vitro cell culture medium, from about 0.35 to about 0.7 part L-glutamic acid, from about 0.75 to about 1.3 parts L-arginine, and an amount of a physiologically acceptable acidic buffer effective to maintain the pH to from about 6.0 to about 6.5.

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**4,337,243**

## IMMUNOSTIMULANT MEDICAMENT AND PROCESS OF PREPARING SAME

**Gerard Ayme, Lyons, France, assignor to Institut Merieux, S.A., Lyons, France**

**Continuation-in-part of Ser. No. 804,150, Jun. 6, 1977, Pat. No. 4,182,751. This application Aug. 30, 1979, Ser. No. 71,591**

**Claims priority, application France, Jun. 4, 1976, 76 16937**

**The portion of the term of this patent subsequent to Jan. 8, 1997, has been disclaimed.**

**Int. Cl.³ A61K *39/02***

**U.S. Cl. 424—92** **21 Claims**

1. A medicament stimulating nonspecific immunity in a subject, obtained by:

(a) extracting an aqueous suspension of a member selected from the group of unicellular whole bacteria, and ground bacteria with a liquid phenol, in the presence of water, at a temperature below 70° C.;

(b) collecting the phenol phase;
(c) eliminating said phenol to leave a substantially phenol-free bacterial extract; and
(d) rendering said extract water-soluble;
wherein said medicament is substantially free of endotoxin and of phenol.

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4,337,244

## ENZYME DERIVATIVES FOR USE IN THE TREATMENT OF VENOUS THROMBOSIS

Richard A. G. Smith, Dorking, England, assignor to Beecham Group Limited, England

Division of Ser. No. 68,205, Aug. 20, 1979, Pat. No. 4,285,932. This application Dec. 16, 1980, Ser. No. 216,799
Claims priority, application United Kingdom, Sep. 7, 1978, 35960/78
The portion of the term of this patent subsequent to Aug. 25, 1998, has been disclaimed.
Int. Cl.³ A61K *37/48*
U.S. Cl. 424—94 13 Claims

1. A prophylactic or therapeutic method for the treatment of venous thrombosis which comprises administering to a human in need thereof a pharmaceutically acceptable carrier together with an in vivo fibrinolytic enzyme in which the catalytic site essential for fibrinolytic activity is blocked by a group removable by hydrolysis at a rate such that the pseudo-first order rate constant for hydrolysis is in the range $10^{-6}$ sec $^{-1}$ to $10^{-3}$ sec $^{-1}$ in isotonic aqueous media at pH 7.4 at 37° C.

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4,337,245

## NUTRIENT COMPOUND

C. Robert Baisden, 3227 Ramsgate Rd., Augusta, Ga. 30909

Continuation-in-part of Ser. No. 170,432, Jul. 21, 1980, abandoned. This application Sep. 14, 1981, Ser. No. 302,313
Int. Cl.³ A61K *33/26, 33/30, 33/32, 33/34*
U.S. Cl. 424—131 11 Claims

1. A nutrient compound having a predetermined plurality of elements being combined in an approximate weight percentage ratio each to the total of said elements within the approximate ranges including: (a) 0.032%–0.035% Scandium; (b) 11.090%–12.623% Titanium; (c) 0.247%–0.250% Vanadium; (d) 0.121%–0.141% Chromium; (e) 1.468%–1.689% Manganese; (f) 85.134%–86.455% Iron; (g) 0.030%–0.041% Cobalt; (h) 0.093%–0.106% Nickel; (i) 0.081%–0.085% Copper; and, (j) 0.120%–0.159% Zinc.

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4,337,246

## SOLID PREPARATION COMPRISING COBAMAMIDE OR MECOBALAMIN

Susumu Iwagiri, Gifu; Teiichi Hattori, Inuyama; Teruyoshi Nasu, Tsushima, and Yasuo Miyake, Inuyama, all of Japan, assignors to Eisai Co., Ltd., Tokyo, Japan

Filed Oct. 24, 1980, Ser. No. 200,122
Claims priority, application Japan, Nov. 22, 1979, 54-150743
Int. Cl.³ A61K *31/00, 47/00*
U.S. Cl. 424—174 10 Claims

1. A process for producing a solid, pharmaceutical composition comprising the steps of mixing cobamamide or mecobalamin and a pharmaceutically acceptable solid carrier to form a first mixture and then granulating said first mixture to obtain first granules thereof; separately mixing a red dye selected from the group consisting of Amaranth, Erythrocin, New Coccine, Phloxine, Rose Bengal and Acid Red, and a pharmaceutically acceptable, solid carrier, to form a second mixture and then granulating said second mixture to obtain second granules thereof; and mixing a multiplicity of said first granules with a multiplicity of second granules to form a granular mixture.

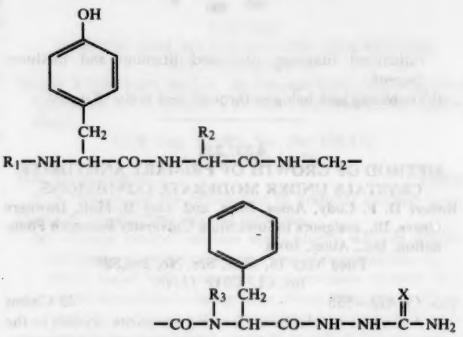
4,337,247

## TETRAPEPTIDESEMICARBAZIDE DERIVATIVES AND THEIR PRODUCTION AND USE

Masahiko Fujino, Takarazuka; Mitsuhiro Wakimasu, Suita, and Kiyohisa Kawai, Nagaokakyo, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Dec. 5, 1980, Ser. No. 213,683
Claims priority, application Japan, Dec. 27, 1979, 54-173608
Int. Cl.³ A61K *37/00*; C07C *103/52*
U.S. Cl. 424—177 25 Claims

1. A compound of the formula:



wherein $R_1$ is hydrogen or lower alkyl; $R_2$ is hydrogen or a side chain of a D-α-amino acid selected from the group consisting of D-leucine, D-alanine, D-methionine, D-methioninesulfoxide, D-methionine sulfone, D-serine, D-threonine, D-phenylalanine, D-α-aminobutyric acid, D-valine, D-norvaline, D-norleucine, D-isoleucine, D-histidine, D-tryptophan, D-tyrosine, D-glutamine, D-asparagine, D-arginine, D-lysine, D-ornithine, D-glutamic acid, D-aspartic acid, D-cysteine, S-methyl-D-cysteine, S-ethyl-D-cysteine, S-methyl-D-cysteine sulfoxide, S-ethyl-D-cysteine sulfoxide, S-methyl-D-methionine, O-t-butyl-D-serine, O-t-butyl-D-threonine, D-aspartic acid-β-methyl ester, and D-glutamic acid-γ-methyl ester; $R_3$ is hydrogen or lower alkyl; X is oxygen or sulfur, or a pharmacologically acceptable salt thereof.

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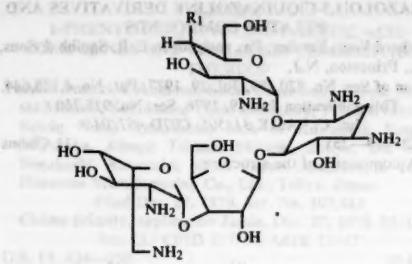
4,337,248

## PAROMOMYCIN CONTAINING COMPOUNDS AND METHOD OF USE

Carlo Battistini, Novate Milanese; Giuseppe Cassinelli, Voghera; Giovanni Franceschi; Rosanna Mazzoleni, both of Milan, and Federico Arcamone, Nerviano, all of Italy, assignors to Farmitalia Carlo Erba S.p.A., Milan, Italy

Filed Jun. 4, 1980, Ser. No. 156,478
Claims priority, application United Kingdom, Jun. 7, 1979, 7919778
Int. Cl.³ A61K *31/71*; C07H *15/22*
U.S. Cl. 424—180 17 Claims

1. A compound of the formula:



wherein $R_1$ represents a hydrogen or chlorine atom and pharmaceutically acceptable acid addition salts of said compound, said acid being selected from the group consisting of citric acid, ascorbic acid, acetic acid, hydrochloric acid, sulfuric acid, maleic acid, nitric acid, phosphoric acid and hydrobromic acid.

**15**. A method of treating ameobic dysentery in human beings and in animals, which method comprises administering an effective amount of a compound as defined in claim 1 to the human being or animal.

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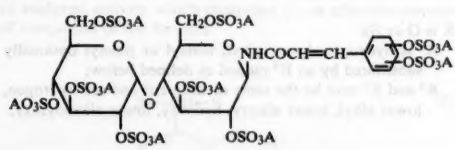
**4,337,249**

## MODULATORS OF THE COMPLEMENT SYSTEM

**Ransom B. Conrow, Pearl River, and Seymour Bernstein, New City, both of N.Y., assignors to American Cyanamid Company, Stamford, Conn.**

**Filed Aug. 3, 1981, Ser. No. 289,641**
**Int. Cl.³ A61K *31/70*; C07H *13/12***
**U.S. Cl. 424—180** **15 Claims**

**6**. A method of modulating the complement system in a body fluid which comprises subjecting said body fluid to the action of an effective complement modulating amount of a pharmaceutically acceptable compound selected from those of the formula:



wherein A is selected from the group consisting of alkali metal cations and alkaline earth metal cations.

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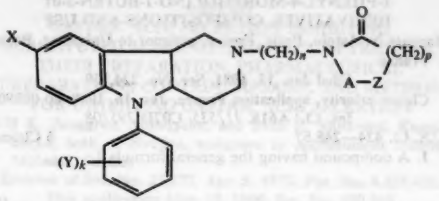
**4,337,250**

## HEXAHYDRO-TRANS- AND TETRAHYDROPYRIDOINDOLE NEUROLEPTIC AGENTS

**Willard M. Welch, Mystic, and Charles A. Harbert, Waterford, both of Conn., assignors to Pfizer Inc., New York, N.Y.**

**Continuation-in-part of Ser. No. 182,177, Aug. 28, 1980, abandoned, which is a division of Ser. No. 61,573, Jul. 30, 1979, Pat. No. 4,252,811. This application Jan. 16, 1981, Ser. No. 225,569**
**Int. Cl.³ C07D *471/14, 413/06*; A61K *31/44, 31/535***
**U.S. Cl. 424—248.57** **12 Claims**

**1**. A (+) enantiomeric, a mixture of (+) and (−) enantiomeric or (±) racemic 4a,9b-trans-hexahydro-1H-pyridoindole derivative of the formula



or a pharmaceutically acceptable salt thereof, wherein

k is 1 or 2;

n is 2 to 9;

p is 0 or 1;

X and Y are each independently H, F, Cl, Br, $OCH_3$, $CH_3$ or $CH_2CH_3$;

A is methano, ethano, propano, etheno, o-benzeno, or a mono or disubstituted form of o-benzeno, the monosubstituent and each of the disubstituents being independently F, Cl, Br, $OCH_3$, $CH_3$ or $CH_2CH_3$ with the proviso that when A is methano, p is 1;

Z is methano, oxygen, sulfur or $NR^2$; and

$R^2$ is H, ($C_1$–$C_5$)alkyl, phenyl, benzyl or a ring mono or disubstituted form of phenyl or benzyl, the monosubstituent and each of the disubstituents being independently F, Cl, Br, $OCH_3$, $CH_3$ or $CH_2CH_3$.

**12**. A method of treating psychoses and neuroses in a patient requiring major tranquilization which comprises administering to the patient by oral, intravenous, intramuscular or subcutaneous route an effective amount of a compound of claim 1.

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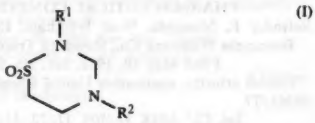
**4,337,251**

## METHOD OF AVOIDING AND REMOVING ADHESIONS

**Rolf W. Pfirrmann, Lucerne, Switzerland, assignor to Ed. Geistlich Sohne AG fur Chemische Industrie, Lucerne, Switzerland**

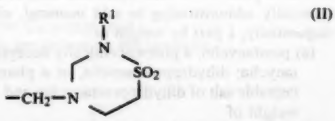
**Filed May 6, 1980, Ser. No. 147,231**
**Claims priority, application United Kingdom, May 9, 1979, 7916017**
**Int. Cl.³ A61K *31/54***
**U.S. Cl. 424—246** **19 Claims**

**1**. A method of treatment of a human or animal in need of said treatment comprising the application of an aqueous solution containing a compound of formula I



(I)

wherein $R^1$ represents a hydrogen atom and $R^2$ represents a hydrogen atom or a group of formula II



(II)

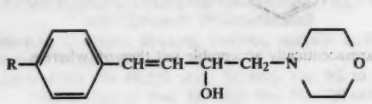
in which $R^1$ is as defined above to human or animal tissue subjected to surgical treatment where no bacterial infection is present whereby the incidence of adhesion formation is eliminated or substantially reduced or whereby existing adhesions are at least substantially detached or unblocked.

## 4,337,252
## 1-PHENYL-4-MORPHOLINO-1-BUTEN-3-01 DERIVATIVES, COMPOSITIONS AND USE

Jacques N. Astoin, Paris, France, assignor to Univablot, Paris, France

Filed Jan. 13, 1981, Ser. No. 224,739
Claims priority, application France, Jan. 16, 1980, 80 00890
Int. Cl.³ A61K *31/535*; C07D *295/08*
U.S. Cl. 424—248.57 5 Claims

1. A compound having the general formula I:



(I)

in which R is OH, $OCH_3$, $OCH_2CH{=}CH_2$ or $OCH_2{-}C{\equiv}CH$ or a halogen atom, and the pharmaceutically-acceptable addition salts thereof.

4. A pharmaceutical composition comprising, as a pharmaceutically-active ingredient, an antidepressant effective amount of a compound as claimed in any one of claims 1 to 3 together with a pharmaceutically-acceptable carrier or diluent.

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## 4,337,253
## 4,5-DIHYDRO-2-METHYL-6-(4-PYRIDINYL)-3(2H)-PYRIDAZINONE AND ITS USE AS A CARDIOTONIC

George Y. Lesher, Schodack, and William B. Dickinson, Albany, both of N.Y., assignors to Sterling Drug Inc., New York, N.Y.

Continuation-in-part of Ser. No. 1 44,564, Apr. 28, 1980, abandoned. This application Mar. 13, 1981, Ser. No. 243,472
Int. Cl.³ C07D *401/04*, *401/06*; A61K *31/50*; C07D *215/50*
U.S. Cl. 424—250 3 Claims

1. 4,5-Dihydro-2-methyl-6-(4-pyridinyl)-3(2H)-pyridazinone or pharmaceutically-acceptable acid-addition salt there.

2. A cardiotonic composition for increasing cardiac contractility, said composition comprising a pharmaceutically-acceptable inert carrier and, as the active component thereof, a cardiotonically-effective amount of 4,5-dihydro-2-methyl-6-(4-pyridinyl)-3(2H)-pyridazinone or pharmaceutically-acceptable acid-addition salt thereof.

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## 4,337,254
## PHARMACEUTICAL COMPOSITIONS

Salvador E. Moncada, West Wickham, England, assignor to Burroughs Wellcome Co., Research Triangle Park, N.C.

Filed May 18, 1978, Ser. No. 907,355
Claims priority, application United Kingdom, Aug. 23, 1977, 35261/77
Int. Cl.³ A61K *31/505*, *31/52*, *31/44*, *31/34*
U.S. Cl. 424—251 4 Claims

1. A method for preventing the lowering of blood pressure in mammals while at the same time inhibiting the aggregation of blood platelets in said mammals, said method comprising internally administrating to said mammal, simultaneously or sequentially, 1 part by weight of:

(a) prostacyclin, a pharmaceutically acceptable salt of prostacyclin; dihydroprostacyclin, or a pharmaceutically acceptable salt of dihydroprostacyclin; and 1 to 200 parts by weight of

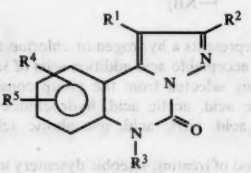
(b) theophylline, 3 isobutyl-1-methyl xanthine, dipyridamole, a pharmaceutically acceptable salt of theophylline, a pharmaceutically acceptable salt of dipyridamole, or a pharmaceutically acceptable salt of 3 isobutyl-1-methyl xanthine; to prevent lowering of blood pressure while at the same time inhibiting aggregation of blood platelets.

## 4,337,255
## PYRAZOLO[1,5-C]QUINAZOLINE DERIVATIVES AND RELATED COMPOUNDS

B. Richard Vogt, Yardley, Pa., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

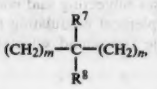
Division of Ser. No. 820,289, Jul. 29, 1977, Pat. No. 4,128,644. This application Jul. 19, 1978, Ser. No. 925,740
Int. Cl.³ A61K *31/505*; C07D *487/04*
U.S. Cl. 424—251 11 Claims

1. A compound of the structure



wherein $R^1$ represents hydrogen, lower alkyl, phenyl optionally substituted with $R^4$, $R^2$ is cyano; or

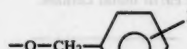
wherein Z is a single bond or

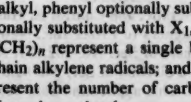


X is O or S);

$R^3$ is hydrogen, lower alkyl, benzyl or phenyl optionally substituted by an $R^4$ radical as defined below;

$R^4$ and $R^5$ may be the same or different and are hydrogen, lower alkyl, lower alkoxy, hydroxy, lower alkanoyloxy,





($X_1$ is hydrogen, lower alkoxy, or $NO_2$);

$R^7$ and $R^8$ may be the same or different and represent hydrogen, lower alkyl, phenyl optionally substituted with $X_1$ or benzyl optionally substituted with $X_1$,

$(CH_2)_m$ and $(CH_2)_n$ represent a single bond or straight or branched chain alkylene radicals; and

m and n represent the number of carbons in the longest normal chain and may be the same or different and are 0 to 10, but m plus n is 10 or less,

and physiologically acceptable salts thereof.

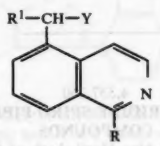
11. A method for treating allergic conditions in mammals, which comprises administering to the mammalian host a therapeutic amount of a compound as defined in claim 1.

## 4,337,256
## 1-PHENYL ISOQUINOLINE-5-ACETIC ACID COMPOUNDS AND ANALGESIC COMPOSITIONS THEREOF

Yasushi Suzuki, Yokohama; Kunio Tsukamoto, Tokyo; Nobuyoshi Minami, Yokohama; Yukio Hasegawa, Yamato; Michitaka Satoh; Norio Yamamoto, both of Kawasaki; Katsuhiko Miyasaka, Atsugi; Takashi Mikami, Tokyo, and Satoshi Funakoshi, Kawasaki, all of Japan, assignors to Teikoku Hormone Manufacturing Co., Ltd., Tokyo, Japan

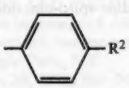
Filed Dec. 27, 1979, Ser. No. 107,613
Claims priority, application Japan, Dec. 27, 1978, 53/160026
Int. Cl.³ C07D *217/16;* A61K *31/47*
U.S. Cl. 424—258 10 Claims

1. A compound of the formula



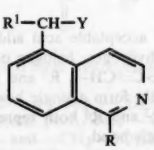
(I)

wherein R represents isopropyl, cyclopentyl, cyclohexyl, or a group of the formula



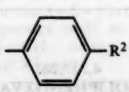
in which $R^2$ represents hydrogen, halogen, methyl, trifluoromethyl, methoxy, methylamino or dimethylamino; $R^1$ represents hydrogen or alkyl of up to 6 carbon atoms; and Y represents carboxyl and alkoxycarbonyl of up to 6 carbon atoms in the alkoxy group; or a salt thereof.

8. A pharmaceutical composition having anti-inflammatory or analgesic activity which comprises (1) an effective amount of compound of the formula



(I)

wherein R represents isopropyl, cyclopentyl, cyclohexyl, or a group of the formula



in which $R^2$ represents hydrogen, halogen, methyl, trifluoromethyl, methoxy, methylamino or dimethylamino; $R^1$ represents hydrogen or alkyl of up to 6 carbon atoms; and Y represents carboxyl and alkoxycarbonyl of up to 6 carbon atoms in the alkoxy group;

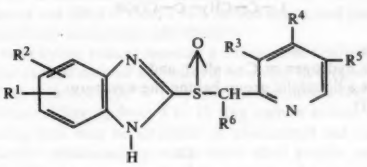
or its pharmaceutically acceptable salt, and (2) a pharmaceutically acceptable diluent or carrier.

## 4,337,257
## GASTRIC ACID SECRETION INHIBITING SUBSTITUTED 2-(2-BENZIMIDAZOLYL)-PYRIDINES, THEIR PREPARATION, PHARMACEUTICAL PREPARATIONS CONTAINING SAME, AND METHOD FOR INHIBITING GASTRIC ACID SECRETION

Ulf K. Junggren, Mölnlycke, and Sven E. Sjöstrand, Kungsbacka, both of Sweden, assignors to Aktiebolaget Hässle, Mölndal, Sweden

Division of Ser. No. 27,277, Apr. 5, 1979, Pat. No. 4,255,431.
This application May 19, 1980, Ser. No. 150,965
Claims priority, application Sweden, Apr. 14, 1978, 7804231
Int. Cl.³ A61K *31/44;* C07D *401/12*
U.S. Cl. 424—263 23 Claims

21. A method of inhibiting gastric acid secretion by administering to mammals, including man, suffering from gastric acid secretion disturbances a compound of the formula III



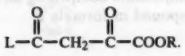
or a pharmaceutically acceptable salt thereof in a therapeutically effective amount in which $R^1$ and $R^2$ are the same or different and are selected from the group consisting of hydrogen, alkyl having from 1–7 carbon atoms, halogen, carbomethoxy, carboethoxy, alkoxy having up to 5 carbon atoms, and alkanoyl having up to 4 carbon atoms in any position, $R^6$ is selected from the group consisting of hydrogen, methyl and ethyl, $R^3$ and $R^5$ are the same or different and are each selected from the group consisting of hydrogen, methyl, methoxy, ethoxy, methoxyethoxy and ethoxyethoxy, and $R^4$ is hydrogen or methyl whereby $R^3$, $R^4$ and $R^5$ are not all hydrogen, and whereby when two of $R^3$, $R^4$ and $R^5$ are hydrogen, the third of $R^3$, $R^4$ and $R^5$ is not methyl.

## 4,337,258
## 2,4-DIOXO-4-SUBSTITUTED-1-BUTANOIC ACID DERIVATIVES USEFUL IN TREATING URINARY TRACT CALCIUM OXALATE LITHIASIS

Clarence S. Rooney, Worcester, Pa.; Haydn W. R. Williams, Dollard des Ormeaux, Canada; Edward J. Cragoe, Jr., Lansdale, Pa., and Arthur A. Patchett, Westfield, N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Dec. 29, 1980, Ser. No. 220,648
Int. Cl.³ C07D *213/55;* A61K *31/44*
U.S. Cl. 424—263 4 Claims

1. A compound of the formula:



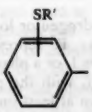
(I)

where

R is hydrogen or $C_{1-4}$ alkyl; and

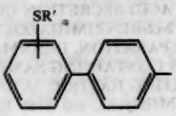
L is a lipophilic group having the structure:

(1)



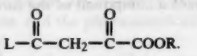
where R′ is pyridyl $C_{1-3}$ alkyl; or

(2)



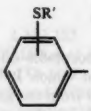
where R' has the same meaning as above;
or a pharmaceutically acceptable salt thereof.

3. A method of treating or preventing the formation of calcium oxalate urinary tract lithiasis, especially kidney or bladder stones, which comprises administering to a patient with, or prone to, such disease a therapeutically effective amount of a compound of the formula:

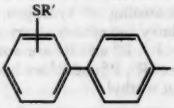


(I)

where
R is hydrogen or $C_{1-4}$ alkyl; and
L is a lipophilic group having the structure:
(1)



where R' is pyridyl $C_{1-3}$ alkyl; or
(2)



where R' has the same meaning as above;
or a pharmaceutically acceptable salt thereof.

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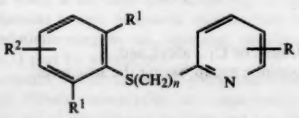
**4,337,259**
**PYRIDINE DERIVATIVES**

**Roger Crossley, Reading, England, assignor to John Wyeth & Brother Limited, Maidenhead, England**

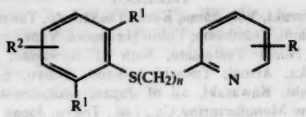
**Filed Feb. 9, 1981, Ser. No. 232,451**
**Claims priority, application United Kingdom, Feb. 20, 1980, 8005668; Feb. 20, 1980, 8005669**
**Int. Cl.³ C07D *213/32*; A61K *31/44***
**U.S. Cl. 424—263** **9 Claims**

1. An anti-ulcer composition comprising an anti-ulcer effective amount of a compound of formula I



wherein R represents hydrogen or lower alkyl, $R^1$ represents hydrogen or lower alkoxy, $R^2$ represents hydrogen, chlorine or trifluoromethyl and n is 1, or a pharmaceutically acceptable acid addition salt thereof, with the proviso that when $R^2$ is hydrogen or chlorine then at least one of $R^1$ is lower alkoxy, and a pharmaceutically acceptable carrier.

4. A method of treating ulcers or hypersecretion in a mammal, which method comprises orally administering to said mammal in need of such treatment an effective amount of a compound of formula I



wherein R represents hydrogen or lower alkyl, $R^1$ represents hydrogen or lower alkoxy, $R^2$ represents hydrogen, chlorine or trifluoromethyl and n is 1, or a pharmaceutically acceptable acid addition salt thereof.

9. 2-(((2-Methoxyphenyl)thio)methyl)pyridine or a pharmaceutically acceptable acid addition salt thereof.

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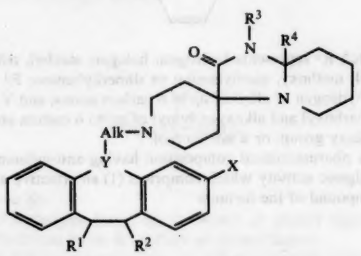
**4,337,260**
**IMIDAZOPYRIDINE-SPIRO-PIPERIDINE COMPOUNDS**

**Chiaki Tashiro, and Ichiro Horii, both of Yoshitomi, Japan, assignors to Yoshitomi Pharmaceutical Industries, Ltd., Osaka, Japan**

**Filed Sep. 10, 1981, Ser. No. 300,824**
**Int. Cl.³ A61K *31/445*; C07D *471/20***
**U.S. Cl. 424—267** **10 Claims**

1. An imidazopyridine-spiro-piperidine compound of the formula:



or a pharmaceutically acceptable acid addition salt thereof, wherein X represents hydrogen, halogen or lower alkoxy, Y represents >N— or >C=CH—, $R^1$ and $R^2$ both represent hydrogen or combinedly form a single bond, Alk represents lower alkylene, and $R^3$ and $R^4$ both represent hydrogen or combinedly form a single bond.

10. A psychotropic composition comprising the compound of claim 1 in combination with a pharmaceutically acceptable inert carrier, said compound being present in a therapeutically effective amount.

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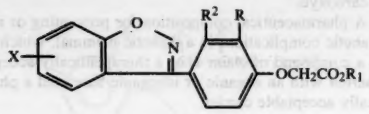
**4,337,261**
**(1,2-BENZISOXAZOL)PHENOXYACETIC ACIDS AS DIURETICS**

**Gregory M. Shutske, Somerset; Linda L. Setescak, Somerville, and Richard C. Allen, Flemington, all of N.J., assignors to Hoechst-Roussel Pharmaceuticals Inc., Somerville, N.J.**

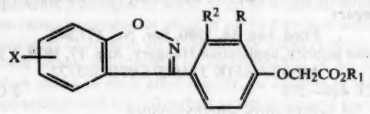
**Filed Jul. 28, 1980, Ser. No. 173,203**
**Int. Cl.³ A61K *31/42*; C07D *261/20***
**U.S. Cl. 424—272** **24 Claims**

1. A compound depicted by the formula



in which R is Cl, $CH_3$ or Br; $R^2$ is Cl, Br or $CH_3$; $R_1$ is hydrogen or lower-alkyl; and X is hydrogen, halogen, loweralkyl, amino, acylamino or nitro; and a physiologically acceptable salt thereof.

**9**. A method of producing diuresis which comprises administering to a patient in need of diuresis a diuretically effective amount of a compound depicted by the formula



in which R is CI, $CH_3$ or Br; $R^2$ is Cl, $CH_3$ or Br; $R_1$ is hydrogen or lower-alkyl; and X is hydrogen, halogen, loweralkyl, amino, acylamino or nitro; and a physiologically acceptable salt thereof.

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**4,337,262**

## HYDANTOIN DERIVATIVES, PHARMACEUTICAL COMPOUNDS AND METHODS OF USE

**Norman Whittaker, Beckenham, and Albert G. Caldwell, West Wickham, both of England, assignors to Burroughs Wellcome Co., Research Triangle Park, N.C.**

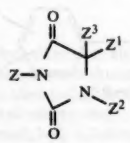
**Filed Nov. 30, 1978, Ser. No. 964,928**

**Claims priority, application United Kingdom, Dec. 1, 1977, 50090/77**

**Int. Cl.**[3] **C07D** *233/78;* **A61K** *31/415*

**U.S. Cl. 424—273 R** **31 Claims**

**1**. A compound of formula (I):



(I)

wherein Z is selected from hydrogen and alkyl of from 1 to 6 carbon atoms;

one of $Z^1$ and $Z^2$ is a group $—CH_2—X—X^1—X^2$ wherein

X is selected from phenylene, —C≡C—, cis and trans —CH=CH— and $—CH_2—CQ_2$, in which each Q is independently selected from hydrogen and alkyl or the two Q's together form an alkylene radical of four, five or six carbon atoms;

$X^1$ is selected from a covalent bond and a straight or branched alkylene chain having from 1 to 6 carbon atoms, optionally having one of any methylene groups replaced by oxa (—O—) or thia (—S—) provided that at least one carbon atom separates such an oxa or thia from a —C≡C—, —CH=CH— or any —CO— group included in the definition of $X^2$; and

$X^2$ is selected from carboxyl, carboxamide, hydroxymethylene and alkoxycarbonyl;

and the other of $Z^1$ and $Z^2$ is a group $—Y—Y^1—Y^2—Y^3$ wherein

Y is $—CR_2—CH_2—$ in which each R is independently selected from hydrogen and methyl;

$Y^1$ is carbonyl, methylene, methylene substituted by hydroxyl or methylene substituted by hydroxyl and alkyl;

$Y^2$ is selected from a covalent bond and straight or branched alkylene having from 1 to 7 carbon atoms, optionally substituted in the carbon adjacent $Y^1$ by one or two groups each of which may be alkyl or a cyclic radical;

$Y^3$ is selected from hydrogen, hydroxy, alkoxy of from 1 to 7 carbon atoms, a cyclic radical, phenyl, benzyl, phenoxy and benzyloxy, wherein each of phenyl, benzyl, phenoxy and benzyloxy may be substituted in benzene ring by one or more groups selected from hydroxy, halogeno, nitro, amino alkylcarbonyl amino, alkenyl, alkoxy, phenyl and alkyl which may itself be substituted by one or more halogeno groups; or $Y^2$ and $Y^3$ together form an alkyl group of from 1 to 7 carbon atoms having at least one hydrogen replaced by fluoro;

or Y is selected from a bond, $—CH_2—$ and $—CH_2.CH_2—$ and $Y^1$, $Y^2$ and $Y^3$ taken together form a cycloalkyl having from 3 to 10 carbon, or bicycloalkyl having from 4 to 10 carbon atoms substituted by a hydroxyl group;

and $Z^3$ is selected from $—CH_2—X—X^1—X^2$ as defined above and alkyl of from 1 to 8 carbon atoms; and pharmaceutically acceptable salts thereof:

the term cyclic radical meaning a monovalent nonheterocyclic radical derived by removal of a ring hydrogen atom from a monocyclic or polycyclic compound (other than benzene) having from 3 to 12 ring carbon atoms, which compound may be saturated or unsaturated and may be further substituted by one or more alkyl groups, and optionally one or more hydrogen atoms of such radicals being replaced by fluoro;

wherein, unless otherwise stated, alkyl moieties are selected from those having from 1 to 6 carbon atoms and alkylene moieties are selected from those having from 2 to 4 carbon atoms.

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**4,337,263**

## 1-ARYL-4-γ-ARYLSULPHONYL-3-AMINOPROPOXY-1H-PYRAZOLES AND THEIR USE AS HYPOLIPEMIANT AND HYPOCHOLESTEROLEMIANT AGENTS

**Henri Techer, Avon; Gilles Monnier, Creteil, and Marcel Pesson, Paris, all of France, assignors to Laboratoire Roger Bellon, Neuilly sur Seine, France**

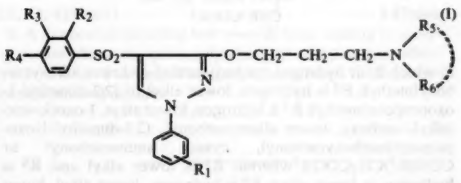
**Filed Jun. 30, 1980, Ser. No. 164,566**

**Claims priority, application France, Jul. 5, 1979, 79 17507**

**Int. Cl.**[3] **A61K** *31/415, 31/505, 31/535;* **C07D** *231/28*

**U.S. Cl. 424—273 P** **9 Claims**

**1**. A compound of the formula:



(I)

wherein:

$R_1$ represents a hydrogen or halogen atom or a $C_{1-3}$ alkyl, $C_{1-3}$ alkoxy or trifluoromethyl radical in the meta or para position on the phenyl group,

$R_2$, $R_3$ and $R_4$ are the same or different and each represents a hydrogen or halogen atom or a $C_{1-3}$ alkyl, $C_{1-3}$ alkoxy or trifluoromethyl group, and

$R_5$ and $R_6$ are the same or different and each represents a hydrogen atom or a $C_{1-3}$ alkyl radical or $R_5$ and $R_6$ together represent, with the nitrogen atom to which they are attached, a morpholino, piperidino or pyrrolidino group, and the non-toxic pharmaceutically-acceptable acid addition salts thereof.

4,337,264

## TERTIARY AMINOACIDS IN THE TREATMENT OF PAIN

Richard W. J. Carney, New Providence, and George De Stevens, Summit, all of N.J., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 307,293, Nov. 16, 1972, which is a continuation-in-part of Ser. No. 181,564, Sep. 17, 1971, Pat. No. 3,767,805, which is a continuation-in-part of Ser. No. 40,436, May 25, 1970, abandoned, which is a continuation-in-part of Ser. No. 8,406, Feb. 3, 1970, abandoned, which is a continuation-in-part of Ser. No. 856,154, Sep. 8, 1969, abandoned, which is a continuation-in-part of Ser. No. 843,244, Jul. 18, 1969, Pat. No. 3,641,040, which is a continuation-in-part of Ser. No. 808,343, Mar. 18, 1969, abandoned, which is a continuation-in-part of Ser. No. 790,863, Jan. 13, 1969, abandoned, which is a continuation-in-part of Ser. No. 757,136, Sep. 3, 1968, Pat. No. 3,657,230, which is a continuation-in-part of Ser. No. 716,347, Mar. 27, 1968, abandoned. This application Sep. 27, 1979, Ser. No. 79,780

Int. Cl.[3] A61K *31/40*

U.S. Cl. 424—274 4 Claims

1. The treatment of pains, said treatment comprising administering to a patient in need of such treatment a therapeutically effective amount of α-[4-(1-oxoisoindolino)phenyl]-propionic acid.

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4,337,265

## CYCLOHEPTA[B]PYRROLE DERIVATIVES

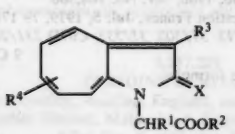
Adi Treasurywala, Pointe Claire; Bozidar Palameta, Dollard des Ormeaux; Tibor Bogri, St. Laurent, and Jehan Bagli, Kirkland, all of Canada, assignors to Ayerst, McKenna & Harrison Inc., Montreal, Canada

Filed Aug. 21, 1981, Ser. No. 295,178

Int. Cl.[3] C07D *209/52;* A61K *31/40, 31/55*

U.S. Cl. 424—274 22 Claims

1. A compound of formula I



(I)

in which $R^1$ is hydrogen, carboxymethyl or lower alkoxycarbonylmethyl; $R^2$ is hydrogen, lower alkyl or (2,2-dimethyl-1-oxopropoxy)methyl; $R^3$ is hydrogen, lower alkyl, 1-oxo(lower-)alkyl, carboxy, lower alkoxycarbonyl, (2,2-dimethyl-1-oxopropoxy)methoxycarbonyl, cyano, aminocarbonyl or $CON(R^5)CH_2COOR^6$wherein $R^5$ is lower alkyl and $R^6$ is hydrogen or lower alkyl; $R^4$ is hydrogen, lower alkyl, lower alkoxy or halo; and X is oxo or thioxo; with the provisos that when $R^1$ is carboxymethyl then $R^2$ is hydrogen, that when $R^1$ is lower alkoxycarbonylmethyl then $R^2$ is lower alkyl, that when $R^2$ is (2,2-dimethyl-1-oxopropoxy)methyl then $R^1$ is hydrogen and $R^3$ is (2,2-dimethyl-1-oxopropoxy)methoxycarbonyl, that when $R^6$ is hydrogen then $R^1$ is hydrogen or carboxymethyl and $R^2$ is hydrogen, that when $R^6$ is lower alkyl then $R^1$ is hydrogen or lower alkoxycarbonylmethyl and $R^2$ is lower alkyl, that when $R^3$ is hydrogen then $R^1$ is hydrogen or carboxymethyl and $R^2$ is hydrogen, and that when X is thio then $R^1$ is hydrogen, $R^2$ is hydrogen, lower alkyl or (2,2-dimethyl-1-oxopropoxy)methyl, and $R^3$ is carboxy, lower alkoxycarbonyl or (2,2-dimethyl-1-oxopropoxy)methoxycarbonyl; or a therapeutically acceptable salt, with an organic or inorganic base, of the compounds of formula I having one or more carboxyls.

20. A pharmaceutical composition for preventing or relieving diabetic complications in a diabetic mammal, which comprises a compound of claim 1, or a therapeutically acceptable salt thereof with an organic or inorganic base, and a pharmaceutically acceptable carrier.

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4,337,266

## CYTOSTATIC TERMINALLY BIFUNCTIONAL SUGAR ALCOHOLS PROCESS FOR PREPARING THEM AND PHARMACEUTICAL COMPOSITIONS CONTAINING THEM

Ildiko Vidra, nee Sándor, 5/c., Budai L.u., 1024 Budapest, and Laszlo Institoris, 32., Eötvös u., 1067 Budapest, both of Hungary

Filed Aug. 14, 1980, Ser. No. 177,948

Claims priority, application Hungary, Aug. 17, 1979, VT 1266

Int. Cl.[3] A61K *31/335;* C07D *303/22*

U.S. Cl. 424—278 2 Claims

1. 1,2-4,5-dianhydro-3-methyl-xylitol.

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4,337,267

## PHENALKOXYALKYL- AND PHENOXYALKYL-SUBSTITUTED OXIRANECARBOXYLIC ACIDS, THEIR USE AND MEDICAMENTS CONTAINING THEM

Klaus Eistetter, Constance, and Erich Rapp, Radolfzell, both of Fed. Rep. of Germany, assignors to Byk Gulden Lomberg Chemische Fabrik GmbH, Constance, Fed. Rep. of Germany

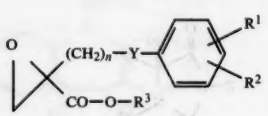
Continuation-in-part of Ser. No. 182,935, Sep. 2, 1980, abandoned. This application Apr. 3, 1981, Ser. No. 250,627

Claims priority, application Switzerland, Aug. 25, 1980, 6397/80; Mar. 6, 1981, 1526/81

Int. Cl.[3] A61K *31/335;* C07D *303/48*

U.S. Cl. 424—278 13 Claims

1. A substituted oxiranecarboxylic acid of the formula



(I)

wherein

$R^1$ is —H, halo, lower alkyl, lower alkoxy, nitro or trifluoromethyl,

$R^2$ has one of the meanings of $R^1$,

$R^3$ is —H or lower alkyl,

Y is $—O—(CH_2)_m—$,

m is O or an integer from 1 to 4, inclusive, and

n is an integer from 2 to 8, inclusive, with the proviso that m+n is an integer from 2 to 8, inclusive,

or a salt of each carboxylic acid.

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4,337,268

## COMBATING FUNGI WITH N-OXIMINOALKYL-ANILIDES

Jörg Stetter, Wuppertal, and Wilhelm Brandes, Leichlingen, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

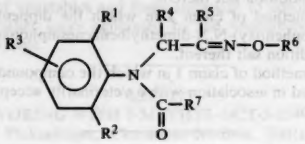
Filed May 15, 1980, Ser. No. 150,261

Claims priority, application Fed. Rep. of Germany, Jun. 5, 1979, 2922759

Int. Cl.[3] A01N *37/22;* C07C *307/68;* C07D *103/175*

U.S. Cl. 424—285 10 Claims

1. An N-oximinoalkyl-anilide of the formula



in which

$R^1$ represents hydrogen, alkyl of up to 4 carbon atoms or halogen,

$R^2$ represents alkyl of up to 4 carbon atoms,

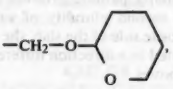
$R^3$ represents hydrogen or alkyl of up to 4 carbon atoms,

$R^4$ represents hydrogen or alkyl of up to 4 carbon atoms,

$R^5$ represents hydrogen or alkyl of up to 4 carbon atoms,

$R^6$ represents hydrogen; alkyl, alkenyl or alkynyl of up to 4 carbon atoms; alkoxyalkyl or alkylthioalkyl of up to 4 carbon atoms in each alkyl moiety; or optionally substituted aralkyl with 6 to 10 carbon atoms in the aryl part and 1 to 2 carbon atoms in the alkyl part wherein the substituents are selected from the group consisting of halogen, straight-chain or branched alkyl of 1 to 4 carbon atoms, halogenoalkyl of 1 to 2 carbon atoms and 1 to 5 halogen atoms, alkoxy of 1 to 2 carbon atoms, alkylthio of 1 to 2 carbon atoms, cyano and nitro, and

$R^7$ represents furyl, tetrahydrofuryl, thiophenyl, or tetrahydrothiophenyl; isoxazolyl which is optionally substituted by alkyl, alkyl, alkenyl, or alkynyl of up to 4 carbon atoms, in each case optionally substituted by cyano or thiocyano; cycloalkyl of 3 to 7 carbon atoms; or the grouping $-CH_2Az$, $-CH_2-OR^8$, $-CH_2-SR^8$, $-OR^8$, $-SR^8$, $-CH_2-OSO_2R^8$, $-COOR^8$ or



wherein

$R^8$ represents an alkyl, alkenyl or alkynyl radical of up to 4 carbon atoms optionally substituted by halogen, cyano or thiocyano, or an alkoxyalkyl radical of up to 4 carbon atoms in each alkyl moiety; and

Az represents pyrazol-1-yl, 1,2,4-triazol-1-yl or imidazol-1-yl.

**9**. A method of combating fungi which comprises applying to the fungi, or to a habitat thereof, a fungicidally effective amount of a compound according to claim **1**.

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**4,337,269**

## PRESERVATIVE COMPOSITIONS

**Philip A. Berke, Madison, and William E. Rosen, Summit, both of N.J., assignors to Sutton Laboratories, Inc., Chatham, N.J.**

**Filed Jul. 23, 1979, Ser. No. 59,969**

**Int. Cl.**[3] **A01N** *37/02, 37/12, 55/02*

**U.S. Cl. 424—289** **3 Claims**

**1**. A method for inhibiting microbial growth in a substance requiring microbial inhibition comprising incorporating into the substance in vitro an effective microbial growth inhibiting amount of a condensation reaction product produced by the reaction of glycine, lower alkyl substituted glycinate or salts thereof with formaldehyde in aqueous medium in a molar ratio of about 1:1.

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**4,337,270**

## NOVEL ANTHRANILIC ACID DERIVATIVES

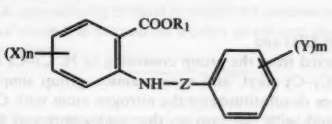
**Kanji Noda, Chikushino; Akira Nakagawa, Tosu; Toshiharu Motomura, Tosu; Masayoshi Tsuji, Tosu; Hidetoshi Amano, Tosu, and Hiroyuki Ide, Fukuoka, all of Japan, assignors to Hisamitsu Pharmaceutical Co., Inc., Tosu, Japan**

**Filed May 21, 1980, Ser. No. 152,217**

**Int. Cl.**[3] **A61K** *31/245;* **C07C** *101/72*

**U.S. Cl. 424—310** **25 Claims**

**1**. A compound of the general formula (I):



(I)

wherein X is a halogen atom, an alkoxyl group having 1–3 carbon atoms, an alkyl group having 1–3 carbon atoms or a nitro group, n is an integer of 1–2, Y is an alkoxyl group having 1–3 carbon atoms, m is an integer of 2–3, Z is —COCH=CH—, $R_1$ is a hydrogen atom or an alkyl group having 1–4 carbon atoms, and pharmaceutically acceptable salts thereof.

**24**. An antiallergic composition comprising a therapeutically effective amount of at least one compound of the general formula (I) according to claim **1** and one or more pharmaceutically acceptable carriers or diluents.

**25**. A method of alleviating diseases caused by allergies, such as asthma, hay fever, urticaria and atopic dermatitis, comprising administering a therapeutically effective amount of at least one compound of the general formula (I), according to claim **1** to a subject afflicted with said diseases.

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**4,337,271**

## ERYTHRO-9,10-DIHYDROXYOCTADECAN-1-OL ACETATE A BOLL WEEVIL ANTI-FEEDANT

**Martin Jacobson, Silver Spring, Md., assignor to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.**

**Filed Jan. 28, 1981, Ser. No. 229,215**

**Int. Cl.**[3] **A01N** *37/02*

**U.S. Cl. 424—311** **3 Claims**

**1**. A method of deterring boll weevils from feeding in growing cotton plants comprising applying to said plants an effective boll weevil deterrent amount of erythro-9,10-dihydroxyoctadecan-1-ol acetate.

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**4,337,272**

## AMINO-ETHANOL DERIVATIVES

**Virgilio Bernareggi, Cologno Monzese; Giuseppe Crespi, Arese, and Giuseppe Bugada, Bergamo, all of Italy, assignors to Valeas S. R. L. Industria Chimica E Farmaceutica, Milan, Italy**

**Division of Ser. No. 740,658, Nov. 10, 1976, Pat. No. 4,252,824.**

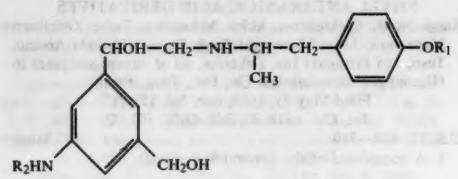
**This application Oct. 2, 1980, Ser. No. 193,136**

**Claims priority, application United Kingdom, Nov. 12, 1975, 46677/75**

**Int. Cl.**[3] **C07C** *95/08, 97/10;* **A61K** *31/135, 31/205*

**U.S. Cl. 424—316** **9 Claims**

**1**. A compound of the formula



wherein

$R_1$ is H or $CH_3$ and

$R_2$ is selected from the group consisting of H, $C_1$–$C_4$ alkyl, carbo $C_1$–$C_3$ alkyl, and a carboamido group simple or mono- or di-substituted on the nitrogen atom with $C_1$–$C_3$ alkyl, and with the proviso that said compound is not 1-(5-amino-3-hydroxymethyl) phenyl-2-(1-p. methoxy phenyl-2-propylamino)ethanol, and a pharmaceutically acceptable acid addition salt thereof.

9. A therapeutic composition useful as a bronchodilator comprising a bronchodilator effective amount of the compound of claim 1 and a pharmaceutically acceptable carrier.

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4,337,273

## METHODS OF INCREASING CORONARY BLOOD FLOW THROUGH VASODILATION BY FLURBIPROFEN

Allan M. Lefer, Montgomery, Pa., assignor to Thomas Jefferson University, Philadelphia, Pa.

Division of Ser. No. 150,048, May 15, 1980, Pat. No. 4,282,252. This application Feb. 17, 1981, Ser. No. 234,681

Int. Cl.³ A61K *31/19*

U.S. Cl. 424—317 5 Claims

1. A method of treating a patient suffering from angina, coronary heart disease, or coronary vasospasm, and who exhibits periodic symptoms of reduced coronary blood flow, which comprises administering to said patient an amount of flurbiprofen effective to cause dilation of the coronary arteries of said patient, whereby coronary blood flow is substantially increased.

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4,337,274

## FLUKICIDAL COMPOUNDS

John H. Gorvin, London, England, assignor to Burroughs Wellcome Co., Research Triangle Park, N.C.

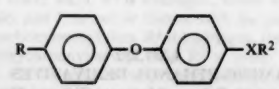
Filed May 29, 1979, Ser. No. 43,492

Claims priority, application United Kingdom, May 30, 1978, 24035/78

Int. Cl.³ A61K *31/18*

U.S. Cl. 424—321 17 Claims

1. A method for the treatment of a liver fluke infection in a mammal comprising the administration to said mammal of an anti-liver-fluke infection effective amount of a diphenylether of the formula



or an acid addition salt thereof wherein R is selected from amino, monoalkanoylamino and dialkanoylamino, both of one to four carbon atoms;

$R^2$ is $NR^8R^9$ wherein $R^8$ is selected from alkyl of one to four carbon atoms, hydroxyalkyl of one to four carbon atoms, aryl of six to ten carbon atoms and cycloalkyl of three to eight carbon atoms, and $R^9$ is selected from $R^8$ as defined and hydrogen; and X is S, SO or $SO_2$.

2. The method of claim 1 in which the diphenylether is 4-(4-Acetamidophenoxy)-N,N-dimethylbenzenesulphonamide or an acid addition salt thereof.

4. The method of claim 1 in which the diphenylether is 4-(4-Aminophenoxy)-N,N-dimethylbenzenesulphonamide or an acid addition salt thereof.

17. The method of claim 1 in which the compound or salt is administered in association with a veterinarily acceptable carrier therefor.

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4,337,275

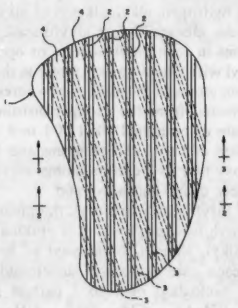
## MEAT PRODUCT AND PROCESS OF PREPARATION

Edward G. Adams, Paoli, Pa., assignor to Keystone Foods Corporation, Folcroft, Pa.

Filed Sep. 3, 1980, Ser. No. 183,853

Int. Cl.³ A23L *1/31;* A23P *1/00*

U.S. Cl. 426—104 16 Claims



1. A slab of frozen, compacted, meat particles having a first plurality of substantially parallel grooves on one side of the slab, and having a second plurality of substantially parallel grooves on the opposite side of the slab, the second plurality of grooves being oriented in a direction different from that of the first plurality of grooves.

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4,337,276

## METHOD FOR STORING PRODUCE AND CONTAINER AND FRESHNESS KEEPING AGENT THEREFORE

Hachiro Nakamura, Ichikawa, and Norio Nakazawa, Kawaguchi, both of Japan, assignors to Toppan Printing Company, Limited, Japan

Continuation of Ser. No. 946,409, Sep. 27, 1978, abandoned. This application Feb. 19, 1980, Ser. No. 122,693

Claims priority, application Japan, Nov. 21, 1977, 52-139636; Dec. 26, 1977, 52-157015; Jan. 19, 1978, 53-4733

Int. Cl.³ B65D *81/24, 85/50*

U.S. Cl. 426—124 11 Claims

1. A closed storage container containing vegetables and fruits tending to be discolored by water evaporation and further containing a permeable bag containing a freshness keeping agent composition for vegetables and fruits which agent consists essentially of (i) from 30 to 100% of a mixture of adsorbents consisting essentially of from about 50 to 100% by weight of a mixture of main adsorbents selected from the group consisting of a bentonite-activated carbon mixture and a bentonite-zeolite mixture, each of the main adsorbents being present in an amount within the range of between 20 and 80% by weight of the total amount of said main adsorbents and from 0 to 50% by weight of at least one auxiliary adsorbent selected from the group of activated alumina and activated clay, (ii) from 0 to about 50% be weight of at least one oxygen-removing compound selected from the group consisting of sulfates and chlorides of manganese (II), iron (II), cobalt (II) and nickel (II), (iii) 0 to about 30% by weight of ascorbic acid or salts thereof, and (iv) 0 to about 30% by weight of at least one alkaline compound selected from the group consisting of hy-

droxides, carbonates and bicarbonates; said freshness keeping agent composition being present in an amount relative to the amount of vegetables and fruits sufficient to adsorb ethylene and the other gases generated by the vegetables and fruits during storage.

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4,337,277

## FLAVORING WITH 7-METHYL-OCT-3-EN-2-ONE

Wilhelm Pickenhagen, Chavannes-des-Bois, Switzerland, assignor to Firmenich SA, Geneva, Switzerland

PCT No. PCT/CH80/00097, § 371 Date May 18, 1981, § 102(e) Date Apr. 22, 1981, PCT Pub. No. WO81/00802, PCT Pub. Date Apr. 2, 1981

PCT Filed Aug. 8, 1980, Ser. No. 253,844

Claims priority, application Switzerland, Sep. 18, 1979, 8409/79

Int. Cl.³ A23L *1/226*

U.S. Cl. 426—534 4 Claims

1. A process for reinforcing, improving or modifying the organoleptic properties of foodstuffs or beverages comprising adding thereto from about 0.1 to 10 ppm based on the weight of said foodstuff or beverage of substantially pure 7-methyl-oct-3-en-2-one.

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4,337,278

## IMITATION MILK

Roy A. Brog, 1600 N. Main, Logan, Utah 84321

Filed Sep. 9, 1980, Ser. No. 185,534

Int. Cl.³ A23C *11/00*

U.S. Cl. 426—583 13 Claims

1. An imitation milk composition having a solids content consisting essentially of 40 to 60% by weight of sweet whey solids, 4 to 10% by weight of a soluble casein salt, 10 to 40% by weight sugar and 5 to 35% by weight of an edible vegetable oil wherein the weight ratio of soluble casein salt to the protein in the whey may vary from about 0.8:1 to 1.2:1 and wherein the weight ratio of sugar to lactose contained in the whey may vary from about 0.4:1 to 1:1.

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4,337,279

## METHOD FOR INCREASING THE PEEL STRENGTH OF METAL-CLAD POLYMERS

Anthony J. Polak, Wauconda, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Jan. 23, 1981, Ser. No. 228,019

Int. Cl.³ B05D *3/06*

U.S. Cl. 427—40 10 Claims

1. A process for increasing the peel strength of a metal-clad polysulfone polymer which comprises subjecting said polysulfone polymer to a gas plasma comprising the presence of a treatment gas and an electrical field generated from an electrical power of from about 50 to about 15000 watts, at a temperature of from about ambient to about the glass transition temperature of said polysulfone polymer and a pressure in the range of from about 5 atmospheres to about $10^{-6}$ torr for a period of time ranging from about 5 minutes to about 4 hours and thereafter depositing a metal on the resultant treated polysulfone polymer and thereafter recovering the metal-clad polysulfone polymer possessing increased peel strength.

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4,337,280

## DESENSITIZER COMPOSITION

Akio Miyamoto; Teruo Kobayashi, and Hiroharu Matsukawa, all of Fujinomiya, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

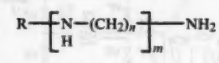
Filed Nov. 5, 1980, Ser. No. 204,668

Claims priority, application Japan, Nov. 6, 1979, 54/144157

Int. Cl.³ B41M *5/00*

U.S. Cl. 427—150 6 Claims

1. A desensitizer composition for color developing agents which color upon reaction with colorless compounds comprising an adduct of an amine represented by the following general formula (I) with one or more alkylene oxides, said one or more alkylene oxides comprising at least 40 mole % butylene oxide, general formula (I) being



(I)

wherein R represents a hydrogen atom or an alkyl group, m represents zero or an integer from 1 to 8, and n represents an integer from 1 to 12.

2. A desensitizing method in which the desensitizer composition of claim 1 is printed on a color developer sheet using by offset printing.

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4,337,281

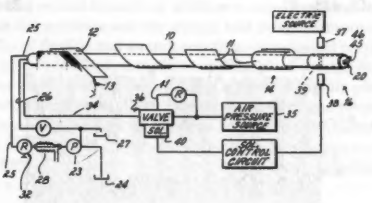
## METHOD FOR STRIPING INSIDE SEAMS OF CANS

Jacob J. Boone, Vermilion, Ohio, assignor to Nordson Corporation, Amherst, Ohio

Filed Feb. 25, 1981, Ser. No. 237,891

Int. Cl.³ B05D *7/28, 7/14*

U.S. Cl. 427—236 11 Claims




1. A method of applying a continuous impervious protective coating in the form of a stripe over the longitudinal welded seam area of can bodies, which method comprises the steps of:

moving a series of can bodies having longitudinally welded seams along a can forming line past the nozzle orifice of an airless spray applicator,

locating said airless spray applicator interiorly of said can bodies with said nozzle orifice located in close proximity to said can seam,

supplying a liquid coating material from a source of said coating material to said airless spray applicator at a pressure sufficient to atomize said liquid material when ejected from said airless spray nozzle, and

ejecting said liquid coating material as an airless spray fan of coating material from said nozzle orifice onto the welded seam areas of said can bodies, said seam areas of said can bodies being located sufficiently close to said nozzle orifice that said liquid material is applied to said seam areas as an unatomized solid curtain of liquid coating material.

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4,337,282

## COLOR CHANGE SYSTEM FOR SPRAY COATING APPARATUS

Carl M. Springer, Park Ridge, Ill., assignor to Binks Manufacturing Co., Franklin Park, Ill.

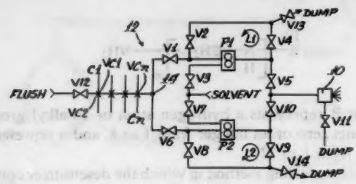
Filed Aug. 12, 1980, Ser. No. 177,399

Int. Cl.³ B05B *7/00*

U.S. Cl. 427—421 13 Claims

1. A method of supplying selected colors of coating materials to coating apparatus with a pair of pumps, comprising the steps of alternately connecting individual ones of the pump inlets with selected ones of the supplies of coating material and the pump outlets with the coating apparatus, such that only one pump at a time provides coating material to the apparatus; and while one of the pumps is providing coating material,

connecting the inlet to the other pump with a supply of solvent for the coating material to continuously clean the pump of




previously provided coating material for as long as the one pump is providing coating material.

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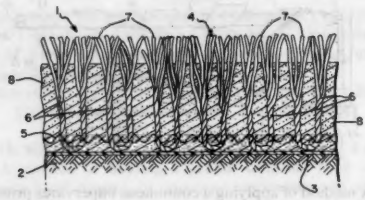
**4,337,283**

**SYNTHETIC TURF PLAYING SURFACE WITH RESILIENT TOP-DRESSING**

**Frederick T. Haas, Jr., 147 E. Oakridge Pk., Metairie, La. 70005**

**Filed Sep. 11, 1980, Ser. No. 186,344**
**Int. Cl.³ A01N *3/00***
**U.S. Cl. 428—17** **29 Claims**



**1.** A playing surface for athletic games comprising:

(a) a firm, stable subsurface;

(b) a pile fabric having a flexible backing and normally upstanding pile elements resembling grass; the length of said pile elements being substantially uniform and lying in the range from ½ to 2 inches; and

(c) a compacted top-dressing layer comprising a mixture of from 25 to 95 volume percent resilient particles and from 5 to 75 volume percent fine sand interspersed among the pile elements and on the backing to a substantially uniform depth at least ½ the length of the pile elements.

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**4,337,284**

**FILM TEAR-TAPE AND PACKAGING FILM HAVING TEAR-TAPE ADHERENT THERETO**

**Gordon Cooper, Hatfield, and Patrick S. Bryant, Welwyn Garden City, both of England, assignors to Imperial Chemical Industries Limited, London, England**

**Continuation of Ser. No. 33,716, Jun. 20, 1979, abandoned. This application Jan. 28, 1980, Ser. No. 115,777**
**Claims priority, application United Kingdom, Feb. 14, 1979, 7905240**
**Int. Cl.³ B65D *1/00*; A61F *13/02*; B32B *27/00***
**U.S. Cl. 428—35** **8 Claims**

**6.** A tearable packaging film comprising a polymeric packaging film and a thermoplastic polymeric tear-tape bonded thereto by a thermally curved layer of a sealing resin comprising a blend of an ethylene-vinyl acetate copolymer and a plasticizer therefor, the plasticizer comprising from 2 to 30 percent by weight of the sealing resin and the tape having a width of from 0.5 to 10 millimeters and a thickness of from 5 to 250 microns.

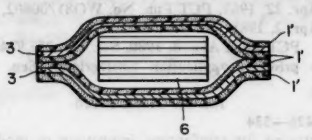
**8.** A tearable package comprising an article wrapped in a tearable packaging film as defined in claim **6**.

**4,337,285**

**WRAPPING MATERIAL FOR LIGHT-SENSITIVE MATERIALS**

**Mutsuo Akao, and Kenzo Kashiwagi, both of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan**

**Filed Aug. 25, 1980, Ser. No. 180,726**
**Claims priority, application Japan, Aug. 23, 1979, 54-107371**
**Int. Cl.³ B65D *85/00*; B32B *5/16, 27/06, 27/16***
**U.S. Cl. 428—35** **17 Claims**



**1.** A wrapping material for light-sensitive materials comprising at least two monoaxially drawn films composed of high density polyethylene having a density of at least 0.94 g/cm³, which are bonded with an adhesive layer containing an aluminum paste or an aluminum powder wherein aluminum is present in an amount of from 0.3 to 12 wt% based on the total weight of the adhesive layer so that drawing axes of the films cross each other at an angle of from 45° to 90°.

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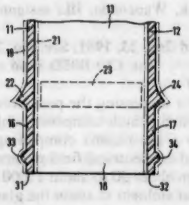
**4,337,286**

**PLASTIC CONTAINERS, PARTICULARLY CANISTERS**

**Wolfram Schiemann, Hohenzollern Platz, 7140 Ludwigsburg, Fed. Rep. of Germany**

**Filed Jan. 16, 1981, Ser. No. 225,612**
**Int. Cl.³ B32B *9/04*; F16L *9/12***
**U.S. Cl. 428—36** **6 Claims**



**1.** Container blank composed of plastic material comprising:

four injection molded side walls having external surfaces,

bottom wall sections extending from said side walls,

said bottom wall sections being arranged and adapted to be bent approximately at right angles to said walls at a predetermined transition region to form the bottom of the container,

a plastic ledge, having an approximately triangular cross section, projecting from said external surface of said side walls in said predetermined transition region,

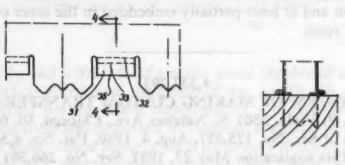
said ledge having a first side of said triangular cross section which forms a continuation of said external surface of said side wall after said bottom wall section is bent and a second side of said triangular cross section which forms a part of the bottom of the container after said bottom wall section is bent, and a point of said triangular cross section at which said sides coverage forming an outside edge at the bottom of the container.

4,337,287

## CORRUGATED TOOTHED WEB STRIP WITH PENETRATION STOPPERS FOR CONSTRUCTION ELEMENTS

Johan C. Falkenberg, Ed. Mercurio, H2, Cerrado de Calderon, Malaga, Spain

Filed Jul. 3, 1980, Ser. No. 165,657
Claims priority, application Norway, Nov. 2, 1979, 793542
Int. Cl.³ B32B *3/28, 7/08;* E04B *2/32;* E04C *2/32*
U.S. Cl. 428—133 6 Claims



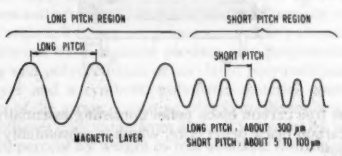
1. A corrugated sheet metal web strip for use in forming a construction element comprising a pair of flanges of nailable material joined together in spaced relationship by a said web strip that extends edgewise therebetween, said strip being provided with a series of flange embedding teeth spaced longitudinally apart along each of the longitudinally extending edges of the strip, said strip being provided with a plurality of penetration stoppers disposed respectively between the teeth on at least one longitudinally extending edge of the strip, said stoppers each comprising an element disposed to extend transversely of the strip edge for abutting the respective flange when the adjacent teeth have become embedded to the intended depth in the flange to thereby inhibit further penetration by the web strip into the flange.

4,337,288

## MAGNETIC RECORDING MEDIUM

Haruo Takenaka; Eiichi Tadokoro, and Masaaki Fujiyama, all of Odawara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Nov. 17, 1980, Ser. No. 207,546
Claims priority, application Japan, Nov. 28, 1979, 54-154784
Int. Cl.³ G11B *5/70*
U.S. Cl. 428—172 5 Claims




1. A magnetic recording medium comprising a non-magnetic support on which a magnetic layer is formed by: coating on said support an emulsion of magnetic material in a binder, wherein said magnetic material is comprised of large filler having a grain size ranging from about 2 μm to about 30 μm and a small filler having a grain size ranging from about 0.01 μm to about 5 μm; and drying, and subjecting the resulting magnetic recording medium to a calendering process utilizing calender rolls under conditions that the pressure between any two rolls ranges from 100 Kg/cm to 400 Kg/cm at a temperature ranging from 20° C. to 150° C., said resulting magnetic layer having a surface roughness controlled such that the maximum value of the arithmetical average roughness is at least about 80 A in the surface roughness pitch region greater than about 300 μm and the maximum value of the arithmetical average roughness is about 40 A to 5 A in the surface roughness pitch region greater than about 5 μm and smaller than about 100 μm.

4,337,289

## WATER RELEASE TRANSFER

Kenneth J. Reed, 33 Carlysle Square, London, S.W.3, England, and Alan L. Lythgoe, 25 Sene Park, Hythe, Kent, England

Continuation of Ser. No. 956,725, Nov. 1, 1978, abandoned. This application Jun. 6, 1980, Ser. No. 157,083
Claims priority, application United Kingdom, Nov. 2, 1977, 45588/77
Int. Cl.³ B32B *3/18;* B44C *1/16*
U.S. Cl. 428—195 15 Claims

1. A water-release transfer which comprises a transferable design formed in a photopolymerized ink supported on a flexible water-permeable carrier substrate and having an intervening water-soluble release layer, which provides a surface capable of being wetted by said ink while in its unpolymerized state, between the substrate and the design, said design comprising a solid film of flexible and stretch-resisting, cross-linked polymer produced by photopolymerization of a liquid ink printed on the substrate and consisting essentially of a blend of rapidly photopolymerized, ethylenically unsaturated monomer and prepolymer containing pendant or terminal acryloyl or methacryloyl groups wherein the prepolymer has about 2 to 6 acryloyl or methacryloyl groups per molecule whereby on photopolymerization a cross-linked and flexible film is produced.

4,337,290

## HIGH IMPACT RESISTANT LAMINATE SURFACE FOR A BOWLING LANE

Peter B. Kelly, and Edward R. Heagle, both of Coshocton, Ohio, assignors to General Electric Company, Coshocton, N.Y.

Filed Nov. 16, 1979, Ser. No. 95,120
Int. Cl.³ B32B *3/00;* A63D *1/04;* B32B *17/08, 23/06*
U.S. Cl. 428—201 12 Claims

1. In a decorative plastic laminate sheet of a length and width for securing to a substrate selected from the group consisting of natural wood, consolidated wood fibers, plywood, flakeboard, chipboard, and hardboard to form therewith all or part of a bowling lane having a surface characterized by a falling ball impact resistance of at least 60 inches, a coefficient of fraction of about 0.16 and a Taber abrasion resistance of at least 500 cycles, said plastic laminate sheet comprising a plurality of thermosetting resin impregnated fibrous core sheets, a melamine resin impregnated decorative fibrous print sheet overlying one of said fibrous core sheets in a contiguous manner, and a melamine resin containing protective layer overlying said decorative fibrous print sheet in a contiguous manner, the improvement which comprises:

said fibrous core sheets being comprised of individual, adjacent, contiguous and alternating glass fiber fabric sheets and crepe paper sheets, said glass being selected from the group consisting of woven glass cloth, glass net and glass scrim, the interlaminer bond strength between said glass and crepe paper sheets being substantially equal to the interlaminer bond strength between resin impregnated paper core sheets.

4,337,291

## DECORATIVE LAMINATE SURFACE FOR BOWLING LANE SURFACE HAVING REDUCED GLOSS

Peter B. Kelly, Bloomfield Hills, Mich., assignor to General Electric Company, Coshocton, N.Y.

Continuation-in-part of Ser. No. 926,604, Jul. 21, 1978, Pat. No. 4,231,573, which is a division of Ser. No. 901,791, May 1, 1978, abandoned, which is a continuation of Ser. No. 506,069, Sep. 16, 1974, abandoned. This application Mar. 6, 1980, Ser. No. 127,567

The portion of the term of this patent subsequent to Nov. 4, 1997, has been disclaimed.

Int. Cl.³ A63D *1/04*; B32B *5/26, 5/30, 31/20*

U.S. Cl. 428—204 15 Claims

1. In a bowling lane having a surface characterized by a falling ball impact resistance of at least 60 inches, a coefficient of friction of at least 0.18 and a Taber abrasion resistance of at least about 500 cycles, said bowling lane comprised of a substrate selected from the group consisting of natural wood, consolidated wood fibers, plywood, flakeboard, chipboard and hardboard, and at least one decorative plastic laminate secured to the surface of said substrate, said plastic laminate sheet comprised of a plurality of thermosetting resin impregnated fibrous core sheets, a melamine resin impregnated decorative fibrous print sheets, and an overlying melamine resin containing protective layer, the improvement which comprises:

said surface further characterized by a 60 degree gloss below about 30 in the machine direction as measured according to NEMA Standard 8-19-1964.

10. A method of producing a bowling lane having a surface characterized by a falling ball impact resistance of at least 60 inches, a coefficient of friction of about 0.18 and a Taber abrasion resistance of at least about 500 cycles comprising:

superimposing a plurality of thermosetting resin impregnated fibrous core sheets on one another so that said ccore sheets are in registration;

superimposing a resin impregnated decorative fibrous print sheet over said thermosetting resin impregnated core sheets in parallel registration therewith;

superimposing an overlying resin containing protective layer over said resin impregnated decorative fibrous print sheet in registration therewith;

consolidating said thermosetting resin impregnated core sheets, said resin impregnated decorative fibrous print sheet and said overlying resin containing protective layer under heat and pressure, in a press pan or plate having a surface which is at least partially matte finished, to produce a unitary decorative plastic laminate sheet, said matte finish being scratch-free and capable of producing a surface on said laminate sheet having a 60 degree gloss below about 30 in the machine direction as measured according to NEMA Standard 8-19-1964; and

bonding the laminate sheet to a substrate selected from the group consisting of natural wood, consolidated wood fibers, plywood, flakeboard, chipboard and hardboard.

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4,337,292

## SHEET MATERIAL FOR USE AS PLAYING SURFACES AND METHOD FOR THE MANUFACTURE THEREOF

Gerard Biotteau, Saint-Pierre-Montlimart, France, assignor to Societe a Responsabilite Limitee Eram Industrie, Challones sur Loire, France

Filed Oct. 18, 1979, Ser. No. 86,045

Claims priority, application France, Oct. 18, 1978, 78 29641

Int. Cl.³ B32B *5/16, 5/30*

U.S. Cl. 428—141 4 Claims

1. Sheet material for playing surfaces, comprising a layer of a non-woven fabric of polyester fibers calendered to a thickness of about 0.2 mm, a layer of polymerizable resin selected from the group consisting of polyurethane and polychloroprene binder compatible with the polyester fibers and disposed on the calendered layer of polyester fibers, and a layer of a finely divided elastomeric powder on the layer of polymerizable resin and at least partially embedded in the layer of polymerized resin.

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4,337,293

## SYSTEM OF MAKING CUSTOM TRANSFERS

Michael R. Viola, 3501 N. Natchez Ave., Chicago, Ill. 60634

Division of Ser. No. 175,317, Aug. 4, 1980, Pat. No. 4,304,837. This application May 22, 1981, Ser. No. 266,581

Int. Cl.³ B32B *9/04*

U.S. Cl. 428—337 3 Claims

1. A substrate for making custom transfers, said substrate comprising:

polyvinyl chloride sheeting of film dimension thickness having one side of same bearing a dry composited coating comprising a uniform base coating of a uniform mixture consisting of approximately twenty parts isopropyl alcohol, one part wax and one part talcum powder that is overlaid with a uniform coating of polyvinyl alcohol.

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4,337,294

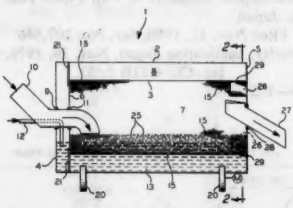
## RUBBER COVERED CARBON BLACK PELLETS

Thomas J. Gunnell, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed May 2, 1980, Ser. No. 145,908

Int. Cl.³ B32B *5/16, 9/00*

U.S. Cl. 428—407 6 Claims



1. Dust free carbon black pellet consisting essentially of

(a) a carbon black pellet core, which is substantially free of rubber

(b) a layer of rubber surrounding said carbon black pellet core.

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4,337,295

## BOROSILICATE, OPAL GLASS ARTICLE

Hermann L. Rittler, Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.

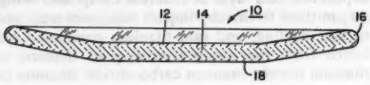
Filed Dec. 13, 1979, Ser. No. 103,413

Int. Cl.³ B32B *17/06*

U.S. Cl. 428—410 3 Claims

1. An integral, colored spontaneous opal glass article composed of an internal, opaque portion encased within a continuous, unbroken surface layer of transparent glass, the vitreous article having a uniform elemental composition throughout its mass, consisting essentially, expressed in weight percent on the oxide basis as calculated from the batch, of 55–80% $SiO_2$, 5–18% $TiO_2$, 4–15% $B_2O_3$, 3–20% of at least one mono- or

divalent metal oxide selected from the group of $Na_2O$, $K_2O$, BaO, CaO, MgO, and SrO, the total monovalent metal oxide content not exceeding 6%, and a $TiO_2$ coupler selected from the group in the indicated propotions of 0.1–5% of an oxide capable of coupling with $TiO_2$ selected from the group of $As_2O_5$, CdO, $CeO_2$, CoO, $Cr_2O_3$, CuO, $Fe_2O_3$, MnO, $MoO_3$, NiO, $Nb_2O_5$, $Nd_2O_3$, $P_2O_5$, $Sb_2O_3$, $SeO_2$, $SnO_2$, $SO_2$, $TeO_2$,




and $V_2O_5$, and 0.001–1% of a noble metal capable of coupling with $TiO_2$ selected from the group of Ag, Au, Pt, Rh, and Ru, the internal portion being composed of a borate-rich phase separated from and dispersed throughout a silicate-rich phase, the two glass phases being of such different refractive index as to render said internal portion opaque, and the surface layer being a transparent, single-phase borosilicate glass.

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## 4,337,296
## METHODS FOR BONDING DISSIMILAR SYNTHETIC POLYMERIC MATERIALS AND THE PRODUCTS INVOLVED IN AND RESULTING FROM SUCH METHODS

**Seevaram N. Varadhachary, Newtown, Pa., assignor to Congoleum Corporation, Kearny, N.J.**

**Filed Aug. 25, 1980, Ser. No. 180,800**
**Int. Cl.[3] B32B** *27/40, 27/30*
**U.S. Cl. 428—420** **26 Claims**

**1.** A multi-layered construction of two dissimilar synthetic polymeric materials comprising a first layer of a vinyl resin and at least one plasticizer for said vinyl resin and from about 10 percent by weight to about 30 percent by weight of a member of the group consisting of acrylates or acrylated polyurethanes, and a second layer covering said first layer of a synthetic polymeric material containing a member of the group consisting of polyurethanes and acrylated polyurethanes, and from about 0.5 percent by weight to about 20 percent by weight of a free radical polymerization initiator capable of initiating a polymerization reaction between said acrylates or acrylated polyurethanes in said first layer and said polyurethanes or acrylated polyurethanes in said second layer, both of said layers having one surface in contact with one surface of the other layer throughout substantially their entire one surface areas and being bonded throughout substantially all of said surface areas in a strong and permanent primary chemical bond therebetween by a reaction product of a polymerization involving said polyurethanes or acrylated polyurethanes in said first layer and a synthetic polymeric material containing a member of the group consisting of polyurethanes or acrylated polyurethanes containing from about 0.5 percent by weight to about 20 percent by weight of free available isocyanate in said second layer.

**19.** A method of improving the bond between a vinyl resin material and a member of the group consisting of polyurethane and acrylated polyurethane resin materials which comprises: including from about 10 percent by weight to about 30 percent by weight of a member of the group consisting of acrylates and acrylated polyurethanes in said vinyl resin material: providing from about 0.5 percent by weight to about 20 percent by weight of a free radical polymerization initiator in said polyurethane or acrylated polyurethane resin material, said polyurethane or acrylated polyurethane resin material containing from about 0.5 percent by weight to about 20 percent by weight of free available isocyanate; bringing said vinyl resin material and said polyurethane or acrylated polyurethane resin material into contact; and exposing said vinyl resin material and said polyurethane or acrylated polyurethane resin material to curing conditions, whereby there is sufficient chemical inter-reaction between said resin materials as to create a strong and permanent chemical bond therebetween in addition to any hydrogen bonds of van der Waals forces.

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## 4,337,297
## COEXTRUDABLE THERMOPLASTIC COMPOSITIONS AND BONDS AND LAMINATES THEREFROM

**Khalid A. Karim, and James H. Rea, both of Houston, Tex., assignors to Gulf Oil Corporation, Pittsburgh, Pa.**

**Filed Jul. 16, 1981, Ser. No. 284,149**
**Int. Cl.[3] C08F** *18/10;* **C09J** *5/06;* **B29D** *9/00;* **B32B** *27/30*
**U.S. Cl. 428—461** **18 Claims**

**1.** A blend of thermoplastic polymers consisting essentially of:

(a) An ethylene copolymer,

(b) A chlorinated polyethylene resin, and

(c) Optionally a tackifying resin;

said ethylene copolymer having polymerized therein about 70 to 90 weight % of ethylene and the balance an alkyl ester of acrylic or methacrylic acid or vinyl acetate; said chlorinated polyethylene resin having an average chlorine content of 20 to 50 weight percent; said tackifying resin being selected from the group consisting of:

(a) Terpene resins having a Ring and Ball softening point of about 10°–150° C.,

(b) Aliphatic hydrocarbon resins having a Ring and Ball softening point of about 10°–135° C.,

(c) Rosin esters having a Ring and Ball softening point of about 65°–140° C.,

(d) Alpha-methylstyrene/vinyl toluene copolymers having a Ring and Ball softening point of about 75°–120° C.,

(e) Polystyrene resins having a Ring and Ball softening point of about 25°–100° C.,

(f) Terpene-phenolic resins having a Ring and Ball softening point of about 80°–135° C.,

(g) Rosin,

(h) Aromatic hydrocarbon resins having a Ring and Ball softening point of about 40°–160° C., and

(j) Terpene-urethane resins having a Ring and Ball softening point of about 80°–135° C.;

said composition containing about 10–90 weight % of the ethylene copolymer, about 10–50 weight % of the chlorinated polyethylene, and about 0–40 weight % of the tackifying resin.

**16.** A laminated sheet construction containing first and third laminae intimately fusion-bonded to a second lamina; each of said first and third laminae sheets being independently fabricated from paper, aluminum, copper, an ethylene polymer, or a polyethylene terephthalate polyester; and said second lamina being fabricated from a polymer composition of claim **1**.

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## 4,337,298
## POLYMER COMPOSITIONS AND LAMINATES PRODUCED BY BONDING OR COEXTRUSION

**Khalid A. Karim; Pallavoor R. Lakshmanan, and James H. Rea, all of Houston, Tex., assignors to Gulf Oil Corporation, Pittsburgh, Pa.**

**Continuation-in-part of Ser. No. 208,207, Nov. 19, 1980, abandoned. This application Aug. 5, 1981, Ser. No. 291,642**
**Int. Cl.[3] C08F** *18/10;* **C09J** *5/06;* **B32B** *27/30;* **B29D** *9/00*
**U.S. Cl. 428—461** **17 Claims**

**1.** A compatible blend of polymers consisting essentially of:

(a) A low density ethylene polymer,

(b) An ethylene copolymer,

(c) An ionomer resin, and

(d) Optionally a tackifying resin;

said low density ethylene polymer having a density of less than about 0.945 and a normal load melt index of about 0.5–20; said ethylene copolymer having polymerized therein about 70 to 90 weight % of ethylene and the balance an alkyl ester of acrylic or methacrylic acid or vinyl acetate; said two ethylene polymers being present in proportions such that the alkyl ester or vinyl acetate moiety of the ethylene copolymer constitutes about 4–12 weight % of the total weight of the two ethylene

polymers; said ionomer resin being a metal salt of an ethylene-acid copolymer which is a copolymer of ethylene and acrylic or methacrylic acid having an acid content of about 1–10 mol % and having a high load melt index of at least about 1.0 and a normal load melt index of up to about 50; said tackifying resin being selected from the group consisting of:

(i) Rosin,

(ii) Terpene resins having a Ring and Ball softening point of about 10°–150° C.,

(iii) Aliphatic hydrocarbon resins having a Ring and Ball softening point of about 10°–135° C.,

(iv) Esters formed between a rosin acid and a di-, tri-, or tetrahydroxy aliphatic alcohol, and

(v) Polyamide resins having a molecular weight of about 2,000 to 12,000, having a Ring and Ball softening point of about 85°–200° C., and having been prepared from an aliphatic diamine and a dibasic acid containing about 36 carbon atoms and prepared by dimerizing an unsaturated aliphatic monobasic acid;

said composition containing 100 parts by weight of the two ethylene polymers, about 2–100 parts by weight of the ionomer resin, and from zero to about 150 parts by weight of the tackifying resin.

15. A laminated sheet construction containing first and third laminae intimately fusion-bonded to a second lamina; each of said first and third laminae sheets being independently fabricated from paper, aluminum, copper, an ethylene homopolymer, an ethylene-vinyl alcohol copolymer, an isotactic propylene polymer or a polyethylene terephthalate polyester; and said second lamina being fabricated from a polymer composition of claim 1.

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**4,337,299**

## PROCESS FOR APPLYING A CORROSION RESISTANT TWO-COAT SYSTEM TO STRUCTURAL STEEL AND COATED STEEL THUS OBTAINED

**Boudewijn van den Bergh, Heerde, Netherlands, assignor to Akzo NV, Arnhem, Netherlands**

**Filed Dec. 8, 1980, Ser. No. 214,248**

**Claims priority, application Netherlands, Dec. 14, 1979, 7909016**

**Int. Cl.³ B22F *7/04***

**U.S. Cl. 428—562** **12 Claims**

1. A process for applying a corrosion resistant system to structural steel, characterized in that to the steel there is successively applied a coat consisting of a zinc dust paint based on a binder and a pigment, the weight ratio of binder to pigment being in the range of 5:95 to 15:85 and the pigment consisting essentially of 55 to 100 percent by weight of metallic zinc and a coat to a composition based on a binder in the form of an aromatic/aliphatic polyhydroxyether and/or a saturated aromatic polyester resin having a number average molecular weight of at least 4000, and a pigment having a Mohs hardness of at least 2, and the volume ratio of the binder to the pigment is in the range of 50:50 to 95:5, the thickness of the first coat being about 15 to 150 μm and that of the second coat about 15 to about 150 μm.

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**4,337,300**

## SURFACE-COATED BLADE MEMBER FOR CUTTING TOOLS AND PROCESS FOR PRODUCING SAME

**Takeshi Itaba, and Shotaro Matsumoto, both of Tokyo, Japan, assignors to Mitsubishi Kinzoku Kabushiki Kaisha, Tokyo, Japan**

**Filed Aug. 8, 1980, Ser. No. 176,272**

**Claims priority, application Japan, Aug. 9, 1979, 54-101540**

**Int. Cl.³ B32B *15/18*; C23C *11/02, 11/08***

**U.S. Cl. 428—627** **8 Claims**

1. A process for producing a surface-coated blade member for cutting tools, which comprises the steps of:

(a) placing a metal substrate in a vacuum chamber;

(b) vapor depositing no larger than 0.9 μm thick layer of titanium on at least one surface of said substrate; and subsequently

(c) vapor depositing at least one layer of titanium compound on said layer of titanium to form a coating on said substrate while maintaining the substrate at a temperature between about 300° C. to about 600° C. during the vapor deposition, said layer of titanium compound being 0.5 to 10 μm thick to thereby impact maximum wear resistance to said coating, and said titanium compound being selected from the group consisting of titanium carbide, titanium nitride, titanium carbo-nitride, titanium oxy-carbide and titanium oxy-carbo-nitride.

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**4,337,301**

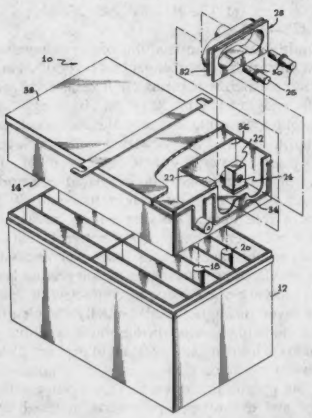
## AIRCRAFT BATTERY

**David L. Rorer, and Jasper E. Hardin, both of Redlands, Calif., assignors to Teledyne Industries, Inc., Los Angeles, Calif.**

**Filed Feb. 23, 1980, Ser. No. 236,670**

**Int. Cl.³ H01M *2/02***

**U.S. Cl. 429—179** **3 Claims**




1. An aircraft battery comprising a casing having a pair of electrical conductors leading therefrom, a cover for the casing through which the pair of conductors protrude and having an aperture in a wall thereof, a pair of lugs each connected to one of the conductors and having an aperture therein aligned with the aperture in the wall of the cover, a receptacle positioned within the aperture in the wall of the cover having apertures therethrough aligned with the aperture in the pair of lugs, a pair of pins each threaded at one end and having a surface thereon adapted to receive a wrench for rotating it about its axis, each pin being positioned with its threaded end passing through the apertures in the receptacle and the lug and its other end extending beyond the cover, and means for securing the threaded ends of the pins to the lugs, the improvement comprising:

the aperture in the wall of the cover shaped in the form of a slot having three sides and an opening at the top edge of the cover;

the receptacle having a groove along the outer edge of the receptacle and designed to slidably engage the sides of the aperture in the wall of the cover;

the pair of lugs molded into the cover and positioned to mate with the pair of conductors when the cover is installed on the casing, each lug further including a threaded nut cast within the lug and aligned with one of the apertures in the receptacle; and

the means for securing the threaded ends of the pins to the lugs includes threading the threaded ends of the pins into the nuts.

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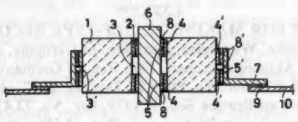
**4,337,302**

## SEALING MEANS FOR TERMINAL SECTION OF SEALED TYPE STORAGE BATTERY

**Yoshihiro Takizawa, Tokyo, Japan, assignor to Furukawa Denchi Kabushiki Kaisha, Yokohama, Japan**

**Filed Apr. 7, 1981, Ser. No. 251,752**
**Claims priority, application Japan, Apr. 12, 1980, 55-47484**
**Int. Cl.³ H01M *2/30***
**U.S. Cl. 429—181** **2 Claims**




1. A sealing means for sealing a metallic terminal to a metallic cover of a sealed-type storage battery, said means comprising an electrically insulating annular member surrounding said terminal, a first bonding member hermetically sealing said terminal to the inner surface of said annular member, a second bonding member hermetically sealing said cover to the outer surface of said annular member, wherein each of said first and second bonding member consists of two sections spaced from each other by at least one annular space formed in the middle of the height of said annular member.

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**4,337,303**

## TRANSFER, ENCAPSULATING, AND FIXING OF TONER IMAGES

**Melville R. V. Sahyun, St. Paul; Tsung-I Chen, Woodbury; Timothy W. King, Shoreview; Valdis Mikelsons, Mendota Heights, and Smarajit Mitra, Woodbury, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.**

**Filed Aug. 11, 1980, Ser. No. 177,259**
**Int. Cl.³ G03G *13/16***
**U.S. Cl. 430—11** **25 Claims**

1. A method of electrography comprising the steps of:

(a) providing a substrate carrying a liquid toner image on at least one surface thereof,

(b) removing up to 100% of the liquid dispersant from said liquid toner image so that the toner material is converted to a dried toner image composition of submicron size particles comprising at least 50% by weight solids,

(c) bringing said dried toner image into contact with a soft or softenable receptor coating in the range of 3 to 100 microns thick on a substrate, applying pressure so that said dried toner image undergoes linear transfer and becomes encapsulated as a homogeneous continuum of particles within the soft or resulting softened receptor coating with at least 75% of the transferred particles not protruding from the surface, the material comprising said soft or softened receptor coating having a Newtonian complex dynamic melt viscosity of less than about $1.7 \pm 0.2 \times 10^3$ poise and a loss tangent greater than 10 at the temperature of transfer, and

(d) hardening the receptor coating.

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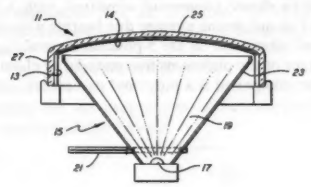
**4,337,304**

## PROCESS FOR DISPOSING AN OPAQUE CONDUCTIVE BAND ON THE SIDEWALL OF A CRT PANEL

**Kurt H. Brenner, Jr.; Arthur C. LaTulip, both of Seneca Falls, N.Y., and James E. Oetken, Winchester, Ky., assignors to North American Philips Consumer Electronics Corp., New York, N.Y.**

**Filed Feb. 17, 1981, Ser. No. 234,983**
**Int. Cl.³ G03C *5/00***
**U.S. Cl. 430—24** **4 Claims**




1. In a glass face panel for a non-matrix CRT having a viewing area peripherally defined by an integral skirt-like sidewall portion terminated by a continuous sealing edge therearound, a process for providing a completely clear viewing area while effecting a defined perimetrical band of black opaque conductive material on said sidewall bordering said viewing area and extending toward the region of said terminal edge and making electrical contact with the mask supporting studs embedded in said sidewall, said process comprising the steps of:

cleaning the interior of a CRT face panel;

completely coating the interior surface thereof with a thick layer of a photosensitive material;

making a first defined exposure of only the viewing area of said panel with an unobstructed flood of radiant energy while shielding said sidewall portion therefrom, said first exposure providing continuous light-polymerization of the photosensitive coating disposed on said viewing area;

effecting a second defined exposure of only the peripheral terminal region of said sidewall portion while peripherally shielding the major portion of said sidewall therefrom, said second exposure being effected by a flood of substantially laterally directed radiant energy to provide continuous polymerization of the photosensitive coating on the terminal peripherally-related region of said side-wall portion;

making a first rinsing of the interior of said panel with a solvent to remove the band of unpolymerized photosensitive material existent on said sidewall portion intermediate the two exposed and polymerized regions;

coating at least the interior sidewall portion of said panel

with a uniform layer of an opaque electrically conductive material;

treating the interior of said panel with a degrading agent to effect degradation of the light-polymerized material on the viewing area and on the terminal region of said sidewall portion;

and effecting a second rinsing of the interior of said panel with a solvent to remove said degraded polymerized material thereby providing a panel having a clean perimetrical terminal region and a clear viewing area while evidencing a defined intermediate perimetrical band of opaque conductive material on the sidewall peripherally framing the viewing area and extending toward said terminal region.

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4,337,305

## SENSITIZED ORGANIC ELECTRON DONOR COMPOUNDS

**Paolo Beretta, Ferrania/Savona, Italy; Louis M. Leichter, Woodbury, and John J. Stofko, Jr., St. Paul, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.**

**Filed Feb. 23, 1981, Ser. No. 236,654**

**Int. Cl.³ G03G *5/04, 5/09***

**U.S. Cl. 430—82** **8 Claims**

1. A photosensitive material comprising an organic electronically active donor compound sensitized with a sensitizing amount of an indolenine cyanine dye bearing a phenylsulfonyl or benzoyl substituent on the 5-position thereof.

2. A layer of the photosensitive material of claim 1 wherein said donor compound is a polyvinyl carbazole.

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4,337,306

## DEVELOPING METHOD IN WHICH A BIAS IS ADJUSTABLE IN ACCORDANCE WITH A LATENT IMAGE AND AN APPARATUS THEREFOR

**Junichiro Kanbe, Tokyo; Kozo Arao, Yokohama, and Nagao Hosono, Chofu all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan**

**Filed Feb. 26, 1980, Ser. No. 124,912**

**Claims priority, application Japan, Mar. 5, 1979, 54-25321**

**Int. Cl.³ G03G *15/09***

**U.S. Cl. 430—122** **20 Claims**

1. A developing method for developing a latent image bearing member into a visible image with a one-component developer carried by a developer carrier, comprising the steps of:

disposing the developer carrier with a space gap with respect to said latent image bearing member in a developing zone;

alternately moving the developer in opposite directions by applying to the developing zone an alternating voltage having a phase for effecting a forward transition of the one-component developer from the developer carrier into contact with the image bearing member, and a phase for effecting reverse transition of the one-component developer from the image bearing member into contact with the developer carrier; and

controlling, in accordance with the potential of the latent image carried by the latent image bearing member, the voltage of at least one of the phases of the alternating phases, for maintaining the said forward and reverse transitions of developer with shifts in latent image potentials.

4,337,307

## LIGHT-SENSITIVE DIAZO COMPOSITION AND MATERIAL WITH BRANCHED POLYURETHANE RESIN

**Rudolf Neubauer, Erbach, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Fed. Rep. of Germany**

**Filed Nov. 28, 1980, Ser. No. 211,399**

**Claims priority, application Fed. Rep. of Germany, Dec. 3, 1979, 2948554**

**Int. Cl.³ G03C *1/60;* G03F *7/08***

**U.S. Cl. 430—157** **9 Claims**

1. A light-sensitive composition which comprises, as the light-sensitive compound, a diazonium salt polycondensation product and, as the binding agent, a branched polyurethane resin, which is a polyaddition product of a compound having at least two isocyanate groups and a compound having at least two active hydrogen atoms capable of reacting with isocyanate groups and which contains no terminal isocyanate groups, wherein all of the terminal groups of said polyaddition product contain active hydrogen atoms and at least part of the terminal units are derived from dihydroxy compounds.

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4,337,308

## PROCESS FOR MAKING RELIEF-TYPE RECORDINGS

**Werner Franke, Wiesbaden, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Fed. Rep. of Germany**

**Continuation of Ser. No. 863,421, Dec. 22, 1977, abandoned. This application Sep. 7, 1979, Ser. No. 73,473**

**Claims priority, application Fed. Rep. of Germany, Dec. 23, 1976, 2658422**

**Int. Cl.³ G03C *5/00***

**U.S. Cl. 430—306** **5 Claims**

1. In a process for making relief-type recordings, in which a layer transfer material consisting substantially of a solid photopolymerizable layer deposited on a flexible temporary layer support and having a peelable cover film on the side away from the temporary layer support, is applied to a permanent layer support in such a manner that the photopolymerizable layer, after removing the peelable cover film, is firmly bonded thereto, the photopolymerizable layer adhering to the permanent layer support is then imagewise exposed, with the temporary layer support being removed from the photopolymerizable layer before or after exposure, the unexposed layer areas are washed away from the permanent support with a developer, and the surface areas of the permanent support bared by washing are modified by etching or depositing a metal, if required,

the improvement wherein the photopolymerizable layer comprises at least two photopolymerizable layers formed by continuously depositing at least two photopolymerizable partial layers of different compositions on the flexible temporary layer support by:

(a) applying a first coating solution of a photopolymerizable composition to said flexible temporary layer support,

(b) drying said first coating solution to obtain a dry photopolymerizable partial layer on said flexible temporary layer support,

(c) thereafter applying a second coating solution of a different photopolymerizable composition to the surface of said dry photopolymerizable partial layer, and

(d) drying said second coating solution to obtain another dry photopolymerizable partial layer on said flexible temporary layer support,

and, if desired, repeating steps (c) and (d) at least once.

4,337,309

## METHOD OF DETERINING THE CONCENTRATION OF PANCREATIC AND SALIVARY α-AMYLASE IN BODY FLUIDS

**Kevin F. McGeeney, Dublin, Ireland, assignor to Pharmacia Diagnostics AB, Sweden**

**Continuation of Ser. No. 882,228, Feb. 28, 1978, abandoned. This application May 28, 1980, Ser. No. 154,041**

**Int. Cl.³ C12Q *1/40*; C12N *9/99***

**U.S. Cl. 435—22** **6 Claims**

1. A method of determining the levels of pancreatic α-amylase and salivary α-amylase in a body fluid containing a mixture of said α-amylases, comprising the following steps:

(a) determining the total α-amylase level ($A_{tot.}$) of a first sample of said body fluid by measuring the total α-amylase activity thereof;

(b) adding to a second sample of said body fluid an inhibitor capable of selectively inhibiting the activity of said α-amylases which inhibitor is obtained by the extraction of cereal grains, in an amount which is effective in inhibiting the activity of a fraction of said α-amylases, said effective amount of said inhibitor being chosen such that it causes a constant degree of inhibition for both pancreatic and salivary α-amylase at total enzyme concentrations ranging from about 50 to about 600 μ/liter; said inhibitor having a discrimination factor, expressed as the ratio between the quantity of inhibitor necessary for reducing the activity of one of said two α-amylases by 50% and the quantity of inhibitor necessary for reducing the same activity of the other of said α-amylases by 50%, of at least 20:1,

(c) determining the level of total α-amylase uninhibited ($A_{res.}$) in said second sample by measuring the total α-amylase activity thereof, the total enzyme concentration of said first and said second body fluid samples being adjusted, where necessary so as to be within the range from about 50 to about 600 μ/liter;

(d) establishing the fraction of total α-amylase uninhibited ($A_{res.}/A_{tot.}$), said fraction being proportional to the ratio (P/S) of the pancreatic α-amylase level (P) to the salivary α-amylase level (S) over a broad range of expected P/S ratios; and

(e) determining the pancreatic α-amylase level (P) and the salivary α-amylase level (S) by comparing said fraction ($A_{res.}/A_{tot.}$) with a standard obtained by performing steps (a), (b), (c), and (d) using a plurality of standard samples each having a different known P/S ratio.

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4,337,310

## METHOD FOR THE DETERMINATION OF α-AMYLASE

**Hans-Georg Batz, Tutzing; Elli Rauscher, Munich; Gunter Weimann, Tutzing; August W. Wahlefeld, Weilheim, and Wolfgang Gruber, Tutzing-Unterzeismering, all of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim-Waldhof, Fed. Rep. of Germany**

**Continuation of Ser. No. 29,814, Apr. 13, 1979, abandoned. This application Sep. 8, 1980, Ser. No. 184,675**

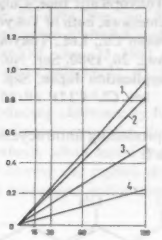
**Claims priority, application Fed. Rep. of Germany, May 2, 1978, 2819298**

**Int. Cl.³ C12Q *1/40***

**U.S. Cl. 435—22** **3 Claims**

1. Method for the determination of alpha-amylase in serum comprising

incubating for a precise period of time of about 15 minutes and at a temperature of about 30° C., the serum suspected of containing alpha-amylase, with a substrate based upon particulate starch derivatized with determinable groups comprising a reactive dyestuff for the determination of alpha-amylase which does not contain a diazo color system, the substrate being a member selected from the group consisting of superficially cross-linked starch grains which are cross-linked with 0.009 to 0.0027 mole of a difunctional cross-linking agent per 100 g non-swollen starch grains and amylose grains which are cross-linked with 0.02 to 0.07 mole of a difunctional cross-linking agent per 100 g of non-swollen amylose grains, said substrate having a regulated, reduced swellability, said starch and amylose grains having a diameter of from 0.01 to 0.20 mm and




measuring said determinable groups as a measure of the initial alpha amylase content.

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4,337,311

## 15 HYDROXYLATION OF 1α,2α-METHYLENE STEROIDS

**Karl Petzoldt; Hermann Steinbeck, and Walter Elger, all of Berlin, Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany**

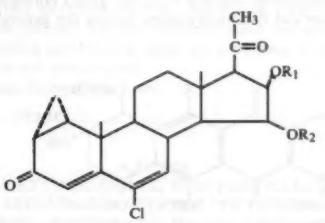
**Division of Ser. No. 886,014, Mar. 13, 1978, Pat. No. 4,196,204. This application Nov. 21, 1979, Ser. No. 96,349**

**Claims priority, application Fed. Rep. of Germany, Mar. 21, 1977, 2712861**

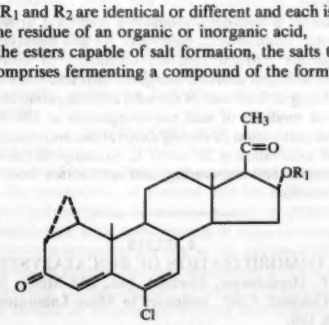
**Int. Cl.³ C12P *33/12***

**U.S. Cl. 435—54** **5 Claims**

1. A process for the preparation of hydroxylated 1α,2α-methylene steroids of the formula




wherein $R_1$ and $R_2$ are identical or different and each is hydrogen or the residue of an organic or inorganic acid, and for the esters capable of salt formation, the salts thereof, which comprises fermenting a compound of the formula



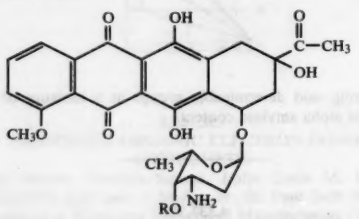

with a bacterial culture of the genus Bacillus and esterifying free hydroxy groups in the 17- or 15-positions when required to produce the desired $R_1$ and $R_2$ moieties.

## 4,337,312
## PROCESS FOR PRODUCING ANTHRACYCLINE GLYCOSIDES

**Toshikazu Oki, Yokohama; Akihiro Yoshimoto, Fujisawa; Kageaki Kouno, Tokyo; Taiji Inui, Chigasaki; Tomio Takeuchi, and Hamao Umezawa, both of Tokyo, all of Japan, assignors to Sanraku-Ocean Co., Ltd., Tokyo, Japan**

**Filed Aug. 26, 1980, Ser. No. 181,545**
**Claims priority, application Japan, Sep. 7, 1979, 54-115521**
**Int. Cl.³ C12P** *19/56*
**U.S. Cl. 435—78** **7 Claims**

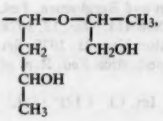
1. A process for producing anthracycline antibiotics having the general formula I:



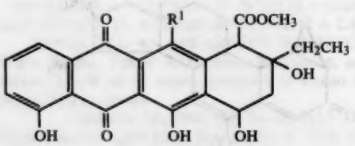
(I)

wherein

R represents a hydrogen atom or the acetal:



which comprises the microbial conversion by cultivating a microorganism of streptomyces, capable of converting an anthracyclinone selected from the group consisting of aklavinone and ε-rhodomycinone having the general formula II:



(II)

wherein

$R^1$ represents a hydrogen atom or a hydroxyl group, to the antibiotics daunomycin, baumycin A1 and baumycin A2, in an aqueous nutrient medium consisting of conventional carbon, nitrogen sources, inorganic salts and trace elements, and adding at least one of the said anthracyclinones into the cultured medium of said microorganism at the beginning stage of cultivation or during cultivation, and continuing the aerobic cultivation at 20° to 40° C. to complete the microbial conversion, and recovering said antibiotics from the cultured medium.

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## 4,337,313
## IMMOBILIZATION OF BIOCATALYSTS

**Donald F. Hershberger, Garfield, Ind., and Moshe M. Sternberg, Oakland, Calif., assignors to Miles Laboratories, Inc., Elkart, Ind.**

**Filed Dec. 8, 1980, Ser. No. 214,218**
**Int. Cl.³ C12N** *11/02, 11/04*
**U.S. Cl. 435—177** **15 Claims**

1. A method for the immobilization of an enzyme producing microorganism or the enzyme produced thereby which comprises forming a reaction product by the steps of:

(a) contacting an aqueous medium containing the enzyme or a mass of bacterial cells having biocatalytic activity with tannin; a long chain, polyamine, cationic flocculating agent selected from the group consisting of poly(acrylamide), poly(ethyleneimine), poly(2-hydroxypropyl-1-N-methylammonium chloride), poly(2-hydroxypropyl-1,1-N-dimethylammonium chloride), poly[N-(dimethylaminomethyl)-acrylamide], poly(diallyldimethylammonium chloride), poly(N,N-dimethylaminoethyl methacrylate), poly[N-dimethylaminopropyl]-methacrylamide and a water soluble epihalohydrin/polyamine copolymer and a crosslinking agent selected from the group consisting of a multifunctional aldehyde, a multifunctional organic halide, a multifunctional anhydride, a multifunctional azo compound, a multifunctional isocyanate and a multifunctional isothiocyanate, and

(b) separating the reaction product from the aqueous medium.

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## 4,337,314
## GENETICALLY ATTENUATED BACTERIAL VACCINES WITH MULTIPLE MUTATIONS OF THE SAME PHENOTYPE

**Max P. Oeschger, Silver Spring, Md.; Anne M. Hooke, Annandale, Va., and Joseph A. Bellanti, Bethesda, Md., assignors to Research Corporation, New York, N.Y.**

**Filed May 23, 1979, Ser. No. 41,896**
**Int. Cl.³ C12N** *1/20*
**U.S. Cl. 435—253** **7 Claims**

1. A biologically pure culture of an avirulent bacterial strain useful as a vaccine, wherein said avirulent strain is derived from a virulent bacterial strain by introducing into said virulent strain at least two mutations of the same phenotype which render said virulent strain avirulent, while permitting said avirulent strain to retain immunogenicity;

wherein said phenotype is a temperature-sensitive phenotype which suppresses growth at the normal body temperature of a host for said virulent strain.

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## 4,337,315
## CONTINUOUS FERMENTOR AND REACTOR

**Susumu Fukushima, Toyonaka; Hideaki Munenobu, Ibaragi, and Kazuhiro Yamade, Wakayama, all of Japan, assignors to Tokyo Kikakikai Co., Ltd., Tokyo; Kansai Chemical Engineering Co., Ltd., Hyogo and Takara Shuzo Co., Ltd., Kyoto, all of, Japan**

**Filed Oct. 17, 1980, Ser. No. 198,090**
**Claims priority, application Japan, Mar. 4, 1980, 55-27724; Jul. 8, 1980, 55-93502**
**Int. Cl.³ C12M** *1/04*
**U.S. Cl. 435—313** **8 Claims**

1. A continuous reactor comprising at least two unit reactors each comprising an open top cone-shaped member;

an inverted open bottom cone-shaped member;

a cylinder, said top and bottom members being connected to said cylinder at opposite ends thereof;

a gas supply member and a liquid introducing pipe connected to a lowest unit reactor; and

a gas separator and a liquid product or slurry product discharge pipe connected to a highest unit reactor.

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**4,337,316**

## SANITARY WARE AND PROCESS OF PRODUCTION

**Werner F. Votava, Broadview Heights, Ohio, assignor to Ferro Corporation, Cleveland, Ohio**

**Filed Sep. 19, 1980, Ser. No. 188,919**
**Int. Cl.³ C03C *5/00, 3/04, 3/22;* C04B *33/00***
**U.S. Cl. 501—21** **4 Claims**

1. A substantially completely vitreous, smelted, clear glass frit containing:

(a) leachable amounts of deflocculent oxides and flocculent alkaline earths and adapted to serve as a ceramic body flux in a ceramic slip without thickening the slip to an unworkable viscosity,

(b) said frit being completely liquid at a smelting temperature of about 2600° F. to about 2750° F. and containing in solution the diopside precursors CaO, MgO, and $SiO_2$, said frit consisting essentially of the following:

| | |
|---|---|
| CaO | 15 to 25 |
| MgO | 10 to 20 |
| $SiO_2$ | 35 to 50 |
| Additive | 5 to 20 |

said additive being selected from one or more of the following in approximately the percent indicated based on the total weight of the glass:

| | |
|---|---|
| $K_2O$ | 0 to 5 |
| $Na_2O$ | 0 to 10 |
| $Li_2O$ | 0 to 5 |
| $Al_2O_3$ | 0 to 12, |

(c) said frit being adapted upon heating to crystallize from solution at least a fluxing amount of said precursors in the form of fine diopside crystals having an average particle size less than one micron and being substantially free of unreacted alkaline earths, and

(d) said deflocculent oxides and flocculent alkaline earths being leachable from said frit in sufficient relative amounts to counterbalance each other and prevent said thickening of the slip to an unworkable viscosity.

4. The glass frit of claim 1 containing 0 to 3.6% $P_2O_5$.

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**4,337,317**

## COMPOSITIONS AND METHODS FOR PRODUCING CLAYWARE

**Ian A. Beard, Surbiton, England, assignor to United States Borax & Chemical Corp., Los Angeles, Calif.**

**Filed Apr. 27, 1981, Ser. No. 257,835**
**Claims priority, application United Kingdom, Jan. 24, 1980, 8002361; European Pat Off., Jan. 23, 1981, 81300325.8**
**Int. Cl.³ C04B *33/13, 33/24***
**U.S. Cl. 501—142** **11 Claims**

1. A method of producing clayware by firing a composition containing clay and a boron-containing flux, characterised in that the flux is a synthetic alkali metal and/or alkaline earth metal aluminosilicate having the crystal structure of a zeolite and containing boron entrapped within that structure.

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**4,337,318**

## PROCESS FOR THE TOTAL PRE-EXPANSION OF POLYURETHANE FOAM

**Earl N. Doyle, 6333 Dixie Dr., Houston, Tex. 77807**

**Filed Sep. 30, 1980, Ser. No. 192,613**
**Int. Cl.³ C08G *18/14***
**U.S. Cl. 521—80** **11 Claims**

1. A process for the production of low density polyurethane foam in the absence of post-expansion, said process comprising the steps of:

(a) mixing together in a mixing zone at ambient temperature (i) a first component comprising polymeric diisocyanate having a functionallty within the range of approximately 2.2 to 2.9, (ii) a second component comprising a blend of polyol, surfactant, and catalyst, and (iii) a blowing agent comprising a gas having a boiling point below approximately −100° F. at atmospheric pressure, the mixture being subjected in said mixing zone to a pressure sufficient to maintain said blowing agent in the liquid state at ambient temperature, said mixture being substantially free of water;

(b) ejecting said mixture from said mixing zone to atmospheric pressure, thereby completely and instantaneously vaporizing said blowing agent and providing total expansion of said mixture, and

(c) curing the resulting foam.

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**4,337,319**

## SELF-EXTINGUISHING, FINE PARTICULATE EXPANDABLE STYRENE POLYMERS

**Josef K. Rigler, Recklinghausen; Hans-Josef Ratajczak, Marl; Horst Leithäuser, Marl, and Karl Trukenbrod, Marl, all of Fed. Rep. of Germany, assignors to Chemische Werke Hüls AG, Marl, Fed. Rep. of Germany**

**Division of Ser. No. 116,842, Jan. 30, 1980, Pat. No. 4,286,071. This application Nov. 12, 1980, Ser. No. 206,282**
**Claims priority, application Fed. Rep. of Germany, Feb. 19, 1979, 2906336**
**Int. Cl.³ C08J *9/14***
**U.S. Cl. 521—96** **4 Claims**

1. In the method for producing particulate molding compositions for the production of foamed articles which consists essentially of polymerizing styrene monomers or styrene monomers in admixture with comonomers in aqueous suspension under intensive mechanical stirring in the presence of an expanding agent, an organic bromine compound and a synergist, the improvement comprising said synergist comprising a hydrocarbon soluble in monomeric styrene and forming stable radicals at temperatures above 300° C. in a concentration of about 0.1 to 3% by weight based on said polymerized styrene, said hydrocarbon selected from the group consisting of dibenzyltoluol, 1-phenyl-1,3,3-trimethylindane and benzyltoluol.

4,337,320

## EXPANDABLE VINYL CHLORIDE RESIN COMPOSITION

Misao Morinaga, Buzen, Japan, assignor to Otsuka Chemical Co., Ltd., Osaka, Japan

Filed Mar. 25, 1981, Ser. No. 247,397
Int. Cl.[3] C08G *18/14, 18/62, 18/58*
U.S. Cl. 521—137 5 Claims

1. An expandable vinyl chloride resin composition for foaming under atmospheric pressure which comprises a resin ingredient comprising (A) a vinyl chloride homopolymer or copolymer having substantially no active hydrogens, (B) a vinyl chloride copolymer having active hydrogens and (C) a thermoplastic polyurethane resin, and a crosslinking agent, a foaming agent, a thermal stabilizer and a plasticizer, the ratio of the components (A), (B) and (C) being 30 to 90:5 to 40:5 to 40 by weight.

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4,337,321

## MULTI-STAGED FOAMING OF THERMOPLASTIC RESIN

Sambasiva R. Allada, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Dec. 2, 1980, Ser. No. 212,168
Int. Cl.[3] B29D *27/00*
U.S. Cl. 521—143 7 Claims

1. In a method of preparing a thermoplastic foam article wherein a heat foamable thermoplastic preform is heated to a temperature at or above the decomposition temperature of a blowing agent compounded in the preform and foamed, the improvement wherein the foamable preform is heated and foamed in a series of foaming stages, said series comprising at least one stress-relieving foaming stage in which the preform is partially foamed at a temperature equal to or above the decomposition temperature of the blowing agent ($T_d$) but below the temperature at which distortion and tearing occurs, and at least one additional foaming stage which is conducted subsequent to said stress-relieving foaming stage and at a temperature higher than that of said stress-relieving foaming stage, and in which foaming is substantially completed at a foaming rate faster than the rate of foaming during said prior stress-relieving foaming stage.

7. A thermoplastic foam article prepared by the foaming method of claim 1.

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4,337,322

## TIRE FILLING COMPOSITION

Lawrence E. Jaspon, 15 Lovers La., Southboro, Mass. 01772

Filed Sep. 8, 1981, Ser. No. 300,210
Int. Cl.[3] C08L *9/10*
U.S. Cl. 523—166 11 Claims

1. A composition for injection into inflatable tires, the composition comprising:
(a) asbestos fiber,
(b) ethylene glycol monomer,
(c) polyethylene glycol,
(d) polyisoprene,
(e) process oil,
(f) detergent,
(g) sodium bicarbonate, and
(h) water

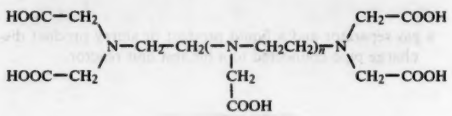
4,337,323

## STABILIZED AQUEOUS DISPERSIONS OF VINYL CHLORIDE POLYMERS

Klaus Adler; Klaus Häfener, and Herbert Eck, all of Burghausen, Fed. Rep. of Germany, assignors to Wacker-Chemie GmbH, Munich, Fed. Rep. of Germany

Continuation of Ser. No. 15,564, Feb. 26, 1979, abandoned. This application Nov. 6, 1980, Ser. No. 204,428
Claims priority, application Fed. Rep. of Germany, Mar. 3, 1978, 2809260
Int. Cl.[3] C08K *5/16*
U.S. Cl. 524—239 3 Claims

1. An aqueous dispersion comprised of a stabilized vinyl chloride homopolymer or copolymer having at least 25% by weight of vinyl chloride units in the polymer and having K values of between 20 and 80 characterized by the presence in said polymer of from 0.3 to 6% by weight of the polymer of one or more of the compounds having the general formula



wherein n has the meaning from 0 to 2, or the water-soluble salts thereof, wherein the the polymer has a particle size range of between 0.001 and 15 μm, in the presence of the customary quantities of protective colloid or emulsifiers, and having solids contents of between 10 and 60% by weight, calculated on the total dispersion.

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4,337,324

## VINYL CHLORIDE RESIN COMPOSITION

Haruhiko Yusa; Yo Iizuka, and Humio Akutsu, all of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 19, 1981, Ser. No. 226,471
Claims priority, application Japan, Jan. 25, 1980, 55-7629
Int. Cl.[3] C08L *51/00*
U.S. Cl. 525—72 7 Claims

1. A vinyl chloride resin composition with improved thermal deformation resistance, impact strength, and processability which comprises:
(A) a vinyl chloride resin;
(B) an impact strength modifier resin; and
(C) a copolymer,
and in which the vinyl chloride resin (A) constitutes 20 to 80% of the composition, the total of the impact strength modifier resin (B) and the copolymer (C) constitutes 80 to 20% of the composition, and the copolymer (C) constitutes 90 to 20% of the total of the impact strength modifier resin (B) and the copolymer (C), said copolymer (C) having been obtained by polymerizing 90 to 30 parts of a monomer mixture comprising 20 to 80% of a monomer selected from the group consisting of α-methylstyrene and 2-isopropenylnaphthalene, 1 to 70% of methyl methacrylate, 5 to 30% of acrylonitrile, and 0 to 30% of a monomer copolymerizable with the preceding monomers in the presence of a crosslinked polymer obtained by copolymerizing 10 to 70 parts of a monofunctional monomer selected from the group consisting of methyl methacrylate, acrylonitrile, methacrylonitrile, styrene, α-methylstyrene, 2-isopropenylnaphthalene, and mixtures thereof with 0.01 to 7 parts of a polyfunctional monomer having a plurality of non-conjugated ethylenic unsaturations, the sum of the quantities of said monofunctional monomer and said monomer mixture being 100 parts, all quantities expressed in percent and parts being by weight.

4,337,325

## PRESSURE-SENSITIVE ADHESIVE

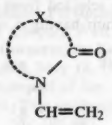
Kishore R. Shah, Chelmsford, Mass., assignor to The Kendall Company, Boston, Mass.

Continuation-in-part of Ser. No. 956,061, Oct. 30, 1978, abandoned. This application Apr. 4, 1980, Ser. No. 137,297

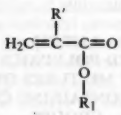
Int. Cl.³ C08L *35/00, 39/06*

U.S. Cl. 525—205 8 Claims

1. A composition consisting essentially of an optically clear blend of (1) a water-soluble polymer of a vinyl lactam having the structure



in which X represents an alkylene bridge having three to five carbon atoms, or a copolymer thereof with 1 to 80 mole percent of copolymerizable monomer containing a polymerizable ethylenic unsaturation, and (2) a tacky water-insoluble copolymer comprising (A) an ester or a mixture of esters having the structure



in which R′ represents hydrogen or methyl and $R_1$ represents alkyl having from 1 to 14 carbon atoms and (B) from 1 to 12% by weight, based on the tacky copolymer of an ethylenic monomer containing an acid group, said vinyl lactam polymer or copolymer being present in an amount from 1 to 30% by weight of the blend and having a glass transition temperature from 20° to 150° C., and the tacky copolymer having a glass transition temperature below 0° C. and being present in an amount from 70 to 99% by weight of the blend and being substantially free from cross-linking and having a viscosity less than 50,000 cps at 350° F. so that it possesses by itself insufficient cohesive strength to be useful as a pressure-sensitive adhesive, said blend having a viscosity less than 100,000 cps at 350° F.

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4,337,326

## PROCESS FOR PRODUCING PROPYLENE-ETHYLENE BLOCK COPOLYMERS

Akinobu Shiga; Masahiro Kakugo; Hajime Sadatoshi; Kazuki Wakamatsu, and Hiroshi Yoshioka, all of Niihama, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Oct. 8, 1980, Ser. No. 194,954

Claims priority, application Japan, Oct. 13, 1979, 54-132004

Int. Cl.³ C08F *297/08*

U.S. Cl. 525—244 3 Claims

1. A process for producing a propylene-ethylene block copolymer by subjecting propylene and ethylene to three-step polymerization using a stereoregular polymerization catalyst, which comprises in the first step polymerizing propylene alone or a propylene/ethylene mixture in the presence of hydrogen so that the average ethylene/propylene reaction ratio is 6/94 or less, thereby polymerizing 60 to 95% by weight of the total polymerization amount, in the second step polymerizing a propylene/ethylene mixture so that the average ethylene/propylene reaction ratio is 25/75 to 67/33, thereby polymerizing 1 to 20% by weight of the total polymerization amount, and in the third-step adding ethylene in such manner that the molar ratio of ethylene to propylene present in the system is in the range of from 25/75 to 60/40, polymerizing a propylene/ethylene mixture in the presence of hydrogen so that the average ethylene/propylene reaction ratio is 76/24 to 89/11, thereby polymerizing 4 to 25% by weight of the total polymerization amount, wherein, in the second and third steps, ethylene alone is supplied thereby gradually decreasing the amount of propylene in the polymerization system from the first step to the succeeding steps.

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4,337,327

## NOVEL BLOCK COPOLYMERS INCLUDING ACRYLONITRILE SEQUENCES AND SEQUENCES INCLUDING UNITS DERIVED FROM GLUTARIMIDE UNITS AND PROCESSES FOR PREPARING SAME

Vladimir A. Stoy, Princeton, N.J., assignor to S.K.Y. Polymers, Inc., N.J.

Continuation-in-part of Ser. No. 166,032, Jul. 7, 1980. This application Sep. 17, 1980, Ser. No. 188,060

Int. Cl.³ C08F *220/48, 293/00*

U.S. Cl. 525—280 15 Claims

1. A novel block copolymer of a molecular weight of from 10,000 to 2,000,000 comprised of acrylonitrile sequences and sequences comprised of at least about 50 mole percent acrylamide units and functional units derived from glutarimide units and selected from the group consisting of carboxyl ester, hydrazide and hydroxylamide units, said acrylomile sequences having a molecular weight of at least 400, said sequence of said acrylamide and said functional units having a molecular weight of at least 400.

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4,337,328

## ACRYLIC POLYMERS HAVING A HIGH SWELLABILITY IN WATER

Arno Holst, Wiesbaden; Eberhard Perplies, Walluf, and Gerhard Buchberger, Wiesbaden, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Continuation of Ser. No. 115,495, Jan. 25, 1980, abandoned. This application Mar. 4, 1981, Ser. No. 240,440

Claims priority, application Fed. Rep. of Germany, Jan. 29, 1979, 2903267

Int. Cl.³ C08F *8/12*

U.S. Cl. 525—336 6 Claims

1. Acrylic polymers which are (a) more than 50 percent by weight insoluble in water, (b) have a high swellability in water, and (c) have degrees of substitution (DS) of $DS_{amide}$ from 0.05 to 0.20 and $DS_{carboxylate}$ from 0.002 to 0.15, said acrylic polymers being produced by reacting polyacrylonitrile or copolymers based on acrylonitrile with an aqueous-alkaline solution at a temperature exceeding 100° C.

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4,337,329

## PROCESS FOR HYDROGENATION OF CONJUGATED DIENE POLYMERS

Yoichiro Kubo, and Kiyomori Ohura, both of Yokohama, Japan, assignors to Nippon Zeon Co., Ltd., Tokyo, Japan

Filed Nov. 26, 1980, Ser. No. 210,688

Claims priority, application Japan, Dec. 6, 1979, 54-158575; Dec. 6, 1979, 54-158576

Int. Cl.³ C08F *8/04*

U.S. Cl. 525—339 5 Claims

1. In a process which comprises catalytically hydrogenating the carbon-carbon double bonds of an unsaturated polymer prepared from 10 to 100% by weight of a conjugated diene monomer unit and 90 to 0% by weight of an ethylenically unsaturated monomer unit, the improvement which comprises using a catalyst composed of a porous powdery or granular carrier having supported thereon both Pd and at least one metal selected from the group consisting of the metals of Groups Ia, IIa, IVa, and VA of the periodic table, Ge Sb, Sc, B, Al, Ga, W and Mo.

## 4,337,330
## BLENDS OF WATER SOLUBLE POLYETHERS AND POLY(HYDROXYETHERS)S

**Lloyd M. Robeson, Whitehouse Station, N.J., assignor to Union Carbide Corporation, Danbury, Conn.**

**Filed Sep. 2, 1980, Ser. No. 183,068**
**Int. Cl.³ C08L** *63/02, 71/02*
**U.S. Cl. 525—407** **8 Claims**

1. A composition comprising a blend of:
(i) a water soluble poly(ethylene oxide), and
(ii) a thermoplastic poly(hydroxyether) having the general formula:

$$[A—O—D—O]_n$$

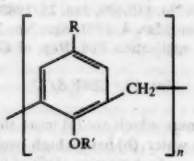
wherein A is a radical residuum of a dihydric phenol, D is a radical residuum of an epoxide selected from mono- and diepoxides and which contain from 1 to 2 hydroxyl groups, and n is an integer which is at least about 20.

## 4,337,331
## CONDUCTIVE POLYMERS, FIBERS MADE THEREFROM AND PROCESS FOR MANUFACTURE

**Roger I. Hancock, Stockton-on-Tees, England, assignor to Imperial Chemical Industries Limited, London, England**

**Filed Jan. 21, 1981, Ser. No. 226,773**
**Claims priority, application United Kingdom, Jan. 31, 1980, 8003231**
**Int. Cl.³ C08L** *77/06, 61/14*
**U.S. Cl. 525—429** **9 Claims**

1. A conductive polymer comprising a fibre-forming synthetic polymer selected from the group consisting of polyester and polyamide having dispersed therein as a separate phase between 1% and 20% by weight inclusive based on the polymer of a polyalkoxylated phenol-formaldehyde condensate having the general formula



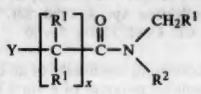

in which n is an integer between 2 and 19 inclusive, R is hydrogen or an alkyl group containing 1 to 20 carbon atoms and R' is $-(CH_2CH_2O)_mH$ in which m is an integer such that the polyalkoxylated phenol-formaldehyde condensate contains between 60% and 95% by weight inclusive of alkylene oxide units based on the weight of the polyalkoxylated phenol-formaldehyde condensate.

## 4,337,332
## LATENTLY CURABLE ORGANOSILICONE COMPOSITIONS

**Kurt C. Melancon, and Frederick J. Palensky, both of St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.**

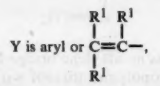
**Filed Apr. 9, 1981, Ser. No. 252,294**
**Int. Cl.³ C08G** *77/06*
**U.S. Cl. 528—15** **23 Claims**

1. A latently curable organosilicone composition, comprising the following components:
(a) an ethylenically unsaturated polysiloxane,
(b) a polyhydrosiloxane,
(c) an amount of a metal-containing catalyst sufficient to facilitate the reaction of components (a) and (b), and
(d) an amount of an unsaturated amide compound sufficient to inhibit premature gelation of the mixture of components (a), (b), and (c) at low, ambient or room temperature but insufficient in amount to prevent hydrosilation of the mixture at an elevated temperature, said unsaturated amide having the structural formula




III

wherein:
$R^1$ is independently selected from $—CH=CH_2$, phenyl, —H, an alkyl group having 1 to 4 carbon atoms, or naphthyl;
$R^2$ is $CH_2R^1$, or allyl;



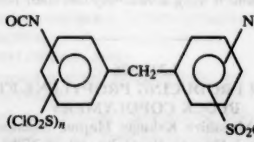

and
x is 0 or 1;
with the proviso that at least one of $R^1$ and $R^2$ is ethylenically or aromatically unsaturated.

## 4,337,333
## SUBSTITUTED POLYISOCYANATE OR POLYISOCYANATE MIXTURES OF THE DIPHENYL METHANE SERIES CONTAINING CHLOROSULFONYL GROUPS

**Helmut Reiff, and Dieter Dieterich, both of Leverkusen, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany**

**Filed Oct. 27, 1980, Ser. No. 200,638**
**Claims priority, application Fed. Rep. of Germany, Nov. 14, 1979, 2945867**
**Int. Cl.³ C08G** *18/76;* **C07C** *119/048*
**U.S. Cl. 528—67** **13 Claims**

13. A process for the preparation of polyisocyanate polyaddition compounds, comprising reacting
(A) a diisocyanate, or diisocyanate mixtures, of the formula:




wherein n is 0 or 1; and
(B) an isocyanate-reactive compound.

## 4,337,334
## PROCESS FOR PRODUCTION OF PHENOLIC RESIN FROM BISPHENOL-A BY-PRODUCTS

**Yoshiro Shimizu, Nagoya; Toshio Itakura, Okazaki; Mitsuhiro Iwasa, Hino, and Kunio Hanauye, Yokohama, all of Japan, assignors to Mitsui Toatsu Chemicals Inc., Tokyo, Japan**

**Filed Feb. 10, 1981, Ser. No. 233,225**
**Int. Cl.³ C08G** *8/20, 8/24*
**U.S. Cl. 528—137** **7 Claims**

1. In a process for producing a phenolic resin which comprises condensing a phenol component and an aldehyde component; the improvement wherein the phenol component comprises high-molecular-weight phenolic compounds which are left after bisphenol A-containing by-products formed in the production of bisphenol A by condensing acetone and phenol in the presence of an acid catalyst are treated at a temperature

of at least 150° C. in the presence of an alkaline catalyst to remove low-boiling components therefrom.

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4,337,335

## TRANSITION METAL SALT COMPLEXES OF POLYAMINO ORGANIC COMPOUNDS

Tattanahalli L. Nagabhushan, Parsippany; William N. Turner, Bloomfield, and Alan Cooper, West Caldwell, all of N.J., assignors to Schering Corporation, Kenilworth, N.J.

Division of Ser. No. 906,895, May 18, 1978, Pat. No. 4,230,847, which is a continuation-in-part of Ser. No. 697,297, Jun. 17, 1976, Pat. No. 4,136,254. This application Dec. 26, 1979, Ser. No. 106,987

Int. Cl.³ C07F *1/08;* C07H *15/22, 11/00, 23/00*

U.S. Cl. 536—13.6 12 Claims

1. A polyamino-organic compound-transition metal salt complex of a polyamino-organic compound devoid of substituents, other than amino or hydroxyl, readily reactable with transition metal salts or acylating agents, wherein at least one of said amino groups has an available neighboring hydroxyl group, and at least one other of said amino groups is devoid of an available neighboring hydroxyl group, or is less reactive to a neighboring hydroxyl group because of steric hindrance, said salt being a salt of a divalent transition metal cation selected from the group consisting of copper (II), nickel (II), cobalt (II), and cadmium (II), or a mixture of said salts, wherein said divalent transition metal salt is combined with said polyamino-organic compound as a complex between said divalent transition metal salt and said available neighboring amino and hydroxyl pairs, the number of complex sites being no greater than the number of said available neighboring amino and hydroxyl group pairs.

2. A complex of claim 1 which is an aminocyclitolamino-glycoside-transition metal salt complex wherein at least one of said amino groups has an available neighboring hydroxyl group and said salt is a salt of a divalent transition metal cation selected from the group consisting of copper (II), nickel (II), cobalt (II) and cadmium (II), or is a mixture of said salts, said aminocyclitol-aminoglycoside-transition metal salt complex having complex sites between said divalent transition metal salt and said available neighboring amino and hydroxyl group pairs, the relative molar quantity of said transition metal salt per mole of said aminocyclitol-aminoglycoside being no greater than the number of said available neighboring amino and hydroxyl group pairs.

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4,337,336

## DERIVATIVE OF KANAMYCIN A AND A PROCESS FOR THE PREPARATION THEREOF

Hamao Umezawa; Sumio Umezawa; Shunzo Fukatsu, all of Tokyo; Toshio Yoneta, and Tadashi Wakazawa, both of Yokohama, all of Japan, assignors to Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai, Tokyo, Japan

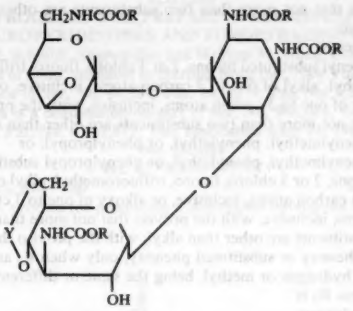
Filed Feb. 18, 1981, Ser. No. 235,576

Claims priority, application Japan, Feb. 25, 1980, 55/21666

Int. Cl.³ A61K *31/71;* C07H *15/22*

U.S. Cl. 536—13.8 6 Claims

1. 3',4'-Anhydro-4'-epi derivatives of kanamycin A of the formula:



(I)

wherein R represents an alkyl of 1–4 carbon atoms, benzyl, phenyl or nitrophenyl, and Y represents an formylidene, ethylidene, isopropylidene, benzylidene, cyclopentylidene cyclohexylidene or tetrahydropyranylidene.

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4,337,337

## 2,5-INTER-O-PHENYLENE-3,4-DINOR-5,9α-EPOXY-6-IODO-PGF$_1$ COMPOUNDS

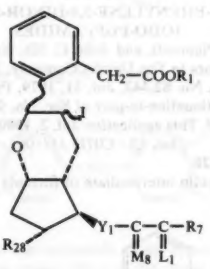
Udo F. Axen, Plainwell, and John C. Sih, Kalamazoo, both of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 62,443, Jul. 31, 1979, Pat. No. 4,312,810, which is a continuation-in-part of Ser. No. 962,845, Nov. 22, 1978, abandoned. This application Jul. 3, 1980, Ser. No. 165,834

Int. Cl.³ C07D *311/00*

U.S. Cl. 542—426 1 Claim

1. A prostacyclin intermediate of formula IX



wherein $R_{28}$ is $—OR_{10}$, $—CH_2OR_{10}$, hydroxy, hydroxymethyl, or hydrogen, wherein $R_{10}$ is a blocking group removable by mild acidic hydrolysis;

wherein $Y_1$ is

(1) trans—CH=CH—,

(2) cis—CH=CH—,

(3) $—CH_2CH_2—$, or

(4) —C≡C—,

wherein $M_8$ is $\alpha$-$R_5$:$\beta$-$OR_{10}$ or $\alpha$-$OR_{10}$:$\beta$-$R_5$, wherein $R_5$ is hydrogen or methyl and $R_{10}$ is as defined above, or $\alpha$-$R_5$:$\beta$-OH or $\alpha$-OH:$\beta$-$R_5$, wherein $R_5$ is as defined above;

wherein $L_1$ is $\alpha$-$R_3$:$\beta$-$R_4$, $\alpha$-$R_4$:$\beta$-$R_3$, or a mixture of $\alpha$-$R_3$:$\beta$-$R_4$ and $\alpha$-$R_4$:$\beta$-$R_3$, wherein $R_3$ and $R_4$ are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of $R_3$ and $R_4$ is fluoro only when the other is hydrogen or fluoro;

wherein $R_7$ is

(1) $—(CH_2)_m—CH_3$, wherein m is an integer from one to 5, inclusive;

(2) phenoxy;

(3) phenoxy substituted by one, 2 or 3 chloro, fluoro, trifluoromethyl, alkyl of one to 3 carbon atoms, inclusive, or

alkoxy of one to 3 carbon atoms, inclusive, with the proviso that not more than two substituents are other than alkyl;
(4) phenyl;
(5) phenyl substituted by one, 2 or 3 chloro, fluoro, trifluoromethyl, alkyl of one to 3 carbon atoms, inclusive, or alkoxy of one to 3 carbon atoms, inclusive, with the proviso that not more than two substituents are other than alkyl;
(6) phenylmethyl, phenylethyl, or phenylpropyl; or
(7) phenylmethyl, phenylethyl, or phenylpropyl substituted by one, 2 or 3 chloro, fluoro, trifluoromethyl, alkyl of one to 3 carbon atoms, inclusive, or alkoxy of one to 3 carbon atoms, inclusive, with the proviso that not more than two substituents are other than alkyl; with the proviso that $R_7$ is phenoxy or substituted phenoxy, only when $R_3$ and $R_4$ are hydrogen or methyl, being the same or different;
wherein $R_1$ is
(1) hydrogen;
(2) alkyl of one to 12 carbon atoms, inclusive;
(3) cycloalkyl of 3 to 10 carbon atoms, inclusive;
(4) aralkyl of 7 to 12 carbon atoms, inclusive;
(5) phenyl;
(6) phenyl substituted with one, 2 or 3 chloro or alkyl of one to 3 carbon atoms; or
(7) phenyl substituted in the para position by
(a) —NH—CO—$R_{25}$
(b) —CO—$R_{26}$
(c) —O—CO—$R_{27}$
(d) —CH=N—NH—CO—$NH_2$
wherein $R_{25}$ is methyl, phenyl, acetamidophenyl, benzamidophenyl, or —$NH_2$; $R_{26}$ is hydroxy, methyl, phenyl, —$NH_2$, or methoxy; and $R_{27}$ is phenyl or acetamidophenyl, inclusive, or a pharmacologically acceptable salt thereof when $R_1$ is hydrogen.

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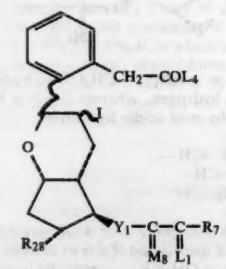
**4,337,338**
**2,5-INTER-O-PHENYLENE-3,4-DINOR-5,9α-EPOXY-6-IODO-PGF$_1$ AMIDES**
**Udo F. Axen, Plainwell, and John C. Sih, Kalamazoo, both of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.**
**Division of Ser. No. 62,443, Jul. 31, 1979, Pat. No. 4,312,810, which is a continuation-in-part of Ser. No. 962,845, Nov. 22, 1978, abandoned. This application Jul. 3, 1980, Ser. No. 165,835**
**Int. Cl.$^3$ C07D *311/00***
**U.S. Cl. 542—426** **1 Claim**

1. A prostacyclin intermediate of formula IX



wherein $R_{28}$ is —$OR_{10}$, —$CH_2OR_{10}$, hydroxy, hydroxymethyl, or hydrogen, wherein $R_{10}$ is a blocking group removable by mild acidic hydrolysis;
wherein $Y_1$ is
(1) trans—CH=CH—,
(2) cis—CH=CH—,
(3) —$CH_2CH_2$—, or
(4) —C≡C—,
wherein $M_8$ is α-Rhd 5:β-$OR_{10}$ or α-$OR_{10}$:β-$R_5$, wherein $R_5$ is hydrogen on methyl and $R_{10}$ is as defined above, or α-$R_5$:β-OH or α-OH:β-$R_5$, wherein $R_5$ is as defined above;
wherein $L_1$ is α-$R_3$:β-$R_4$, α-$R_4$:β-$R_3$, or a mixture of α-$R_3$:β-$R_4$ and α-$R_4$:β-$R_3$, wherein $R_3$ and $R_4$ are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of $R_3$ and $R_4$ is fluoro only when the other is hydrogen or fluoro;
wherein $R_7$ is
(1) —$(CH_2)_m$—$CH_3$, wherein m is an integer from one to 5, inclusive;
(2) phenoxy;
(3) phenoxy substituted by one, 2 or 3 chloro, fluoro, trifluoromethyl, alkyl of one to 3 carbon atoms, inclusive, or alkoxy of one to 3 carbon atoms, inclusive, with the proviso that not more than two substituents are other than alkyl;
(4) phenyl;
(5) phenyl substituted by one, 2 or 3 chloro, fluoro, trifluoromethyl, alkyl of one to 3 carbon atoms, inclusive, or alkoxy of one to 3 carbon atoms, inclusive, with the proviso that not more than two substituents are other than alkyl;
(6) phenylmethyl, phenylethyl, or phenylpropyl; or
(7) phenylmethyl, phenylethyl, or phenylpropyl substituted by one, 2 to 3 chloro, fluoro, trifluoromethyl, alkyl of one to 3 carbon atoms, inclusive, or alkoxy of one to 3 carbon atoms, inclusive, with the proviso that not more than two substituents are other than alkyl; with the proviso that $R_7$ is phenoxy or substituted phenoxy, only when $R_3$ and $R_4$ are hydrogen or methyl, being the same or different;
wherein $L_4$ is
(1) amino of the formula —$NR_{21}R_{22}$, wherein $R_{21}$ and $R_{22}$ are
(a) hydrogen;
(b) alkyl of one to 12 carbon atoms, inclusive;
(c) cycloalkyl of 3 to 10 carbon atoms, inclusive;
(d) aralkyl of 7 to 12 carbon atoms, inclusive;
(e) phenyl;
(f) phenyl substituted with one, 2 or 3 chloro, alkyl of one to 3 carbon atoms, inclusive, hydroxy, carboxy, alkoxycarbonyl of one to 4 carbon atoms, inclusive, or nitro;
(g) carboxyalkyl of 2 to 5 carbon atoms, inclusive;
(h) carbamoylalkyl of 2 to 5 carbon atoms, inclusive;
(i) cyanoalkyl of 2 to 5 carbon atoms, inclusive;
(j) acetylalkyl of 3 to 6 carbon atoms, inclusive;
(k) benzoylalkyl of 7 to 11 carbon atoms, inclusive;
(l) benzoylalkyl substituted by one, 2 or 3 chloro, alkyl of one to 3 carbon atoms, inclusive, hydroxy, alkoxy of one to 3 carbon atoms, inclusive, carboxy, alkoxycarbonyl of one to 4 carbon atoms, inclusive, or nitro;
(m) pyridyl;
(n) pyridyl substituted by one, 2 or 3 chloro, alkyl of one to 3 carbon atoms, inclusive, or alkoxy of one to 3 carbon atoms, inclusive;
(o) pyridylalkyl of 6 to 9 carbon atoms, inclusive;
(p) pyridylalkyl substituted by one, 2 or 3 chloro, alkyl of one to 3 carbon atoms, inclusive, hydroxy or alkoxy of one to 3 carbon atoms, inclusive;
(q) hydroxyalkyl of one to 4 carbon atoms, inclusive;
(r) dihydroxyalkyl of one to 4 carbon atoms, inclusive, or
(s) trihydroxyalkyl of one to 4 carbon atoms, inclusive;
with the further proviso that not more than one of $R_{21}$ and $R_{22}$ is other than hydrogen or alkyl;
(2) cycloamino selected from the group consisting of
(a) pyrrolidino,
(b) piperidino,
(c) morpholino,
(d) piperazino,
(e) hexamethyleneimino,
(f) pyrrolino,
(g) 3,4-didehydropiperidinyl, or
(h) pyrrolidino, piperidino, morpholino, piperazino, hexamethyleneimino, pyrrolino or 3,4-didehydropiperidinyl substituted by one or two alkyl of one to 12 carbon atoms, inclusive;
(3) carbonylamino of the formula —$NR_{23}COR_{21}$, wherein

$R_{23}$ is hydrogen or alkyl of one to 4 carbon atoms and $R_{21}$ is other than hydrogen, but otherwise as defined above; or

(4) sulfonylamino of the formula $—NR_{23}SO_2R_{21}$, wherein $R_{21}$ and $R_{23}$ are as defined in (3).

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**4,337,339**

## PROCESS FOR PREPARATION OF FOLIC ACID DERIVATIVES

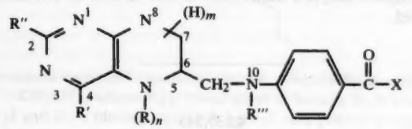
**Peter R. Farina, North Salem, and James A. Grattan, Croton-on-Hudson, both of N.Y., assignors to Baker Instruments Corp., Wilton, Conn.**

**Division of Ser. No. 34,760, Apr. 30, 1979. This application Oct. 31, 1979, Ser. No. 90,059**

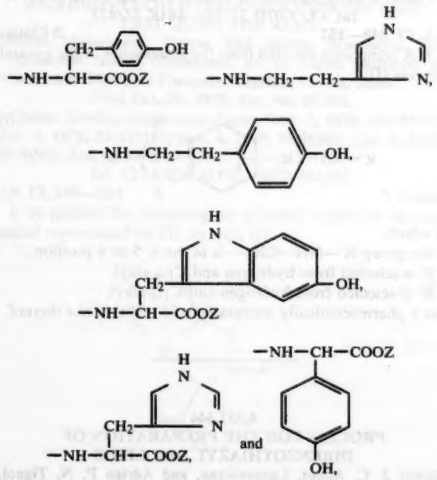
**Int. Cl.³ C07D *475/04***

**U.S. Cl. 544—257** **11 Claims**

1. A process for the preparation of a composition having the formula:



wherein R represents hydrogen, lower alkyl, formyl or iminomethyl; R′ and R″ individually represent lower alkyl, hydroxyl, halo, amino or acetamido; R‴ represents H or lower alkyl; m has a value of 1, 3 or 4; n has a value of zero or 1; and X is an amino acid or des-carboxy amino acid moiety; selected from the group consisting of:



wherein Z is hydrogen or lower alkyl, said process comprising the steps of:

(a) contacting a pteroic acid of the above formula wherein X is —OH, with a blocking agent to protect the nitrogen at the 10 position when R‴ is H.

(b) contacting the pteroic acid of step (a) with an acyl halide under basic conditions to form a mixed anhydride,

(c) condensing said mixed anhydride with HX wherein X is an amino acid moiety or a des-carboxy amino acid moiety as defined above, and

(d) hydrolyzing the product of condensation of step (c) under basic conditions, to provide said composition.

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**4,337,340**

## PROCESSES FOR PREPARING SUBSTITUTED FUROPYRIDINONES AND FUROPYRAZINONES

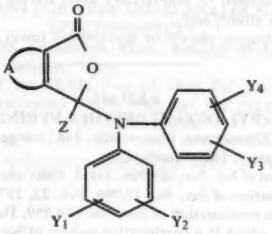
**Paul J. Schmidt, Sharonville, and William M. Hung, Cincinnati, both of Ohio, assignors to Sterling Drug Inc., New York, N.Y.**

**Division of Ser. No. 48,534, Jun. 14, 1979, Pat. No. 4,243,250, which is a continuation-in-part of Ser. No. 968,082, Dec. 11, 1978, Pat. No. 4,211,872. This application Aug. 21, 1980, Ser. No. 180,098**

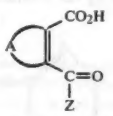
**Int. Cl.³ C07D *491/04***

**U.S. Cl. 544—350** **4 Claims**

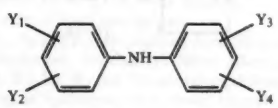
1. A process for producing a compound having the formula



which comprises reacting a pyridinecarboxylic acid or pyrazinecarboxylic acid having the formula

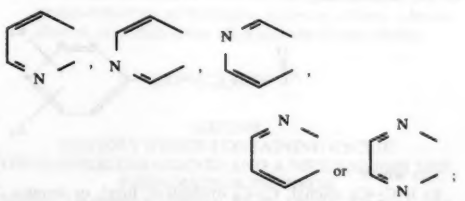


with a diarylamine having the formula



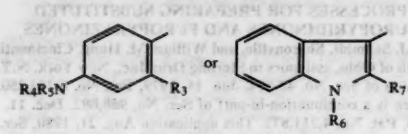
in the presence of the anhydride of an alkanoic acid having from 2 to 5 carbon atoms where in the above formulas:

A is



$Y_1$, $Y_2$, $Y_3$ and $Y_4$ are the same or different and are selected from the group consisting of hydrogen, halo, lower-alkoxy, alkyl having from 1 to 9 carbon atoms, phenyl-lower-alkyl and $NR_1R_2$ where $R_1$ is hydrogen or lower alkyl and $R_2$ is lower alkanoyl, phenylsulfonyl or lower-alkyl-substituted phenylsulfonyl; or NR, $R_2$ is di-lower-alkylamine;

Z is



in which:

$R_3$ is hydrogen, lower alkyl, lower alkoxy, halo or di-lower-alkylamino;

$R_4$ is lower alkyl;

$R_5$ is lower alkyl or benzyl;

$R_6$ is hydrogen or non-tertiary alkyl having from 1 to 18 carbon atoms; and

$R_7$ is hydrogen, phenyl or non-tertiary lower alkyl.

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**4,337,341**

**4A-ARYL-OCTAHYDRO-1H-2-PYRINDINES**

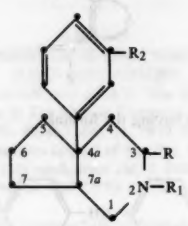
**Dennis M. Zimmerman, Mooresville, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.**

**Continuation of Ser. No. 164,994, Jul. 1, 1980, abandoned, which is a continuation of Ser. No. 13,996, Feb. 22, 1979, abandoned, which is a continuation of Ser. No. 864,899, Dec. 27, 1977, abandoned, which is a continuation-in-part of Ser. No. 737,958, Nov. 2, 1976, abandoned. This application Feb. 2, 1981, Ser. No. 230,556**

**Int. Cl.³ C07D *221/04, 405/06***

**U.S. Cl. 546—112** **5 Claims**

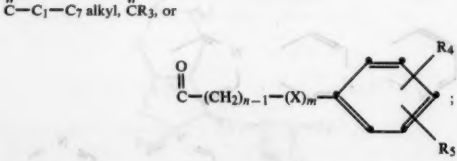
1. A compound having the formula



wherein:

R is hydrogen or $C_1$–$C_5$ alkyl;

$R_1$ is



in which

$R_3$ is $C_2$–$C_7$ alkenyl, $C_3$–$C_6$ cycloalkyl, furyl, or tetrahydrofuryl;

$R_4$ and $R_5$ independently are hydrogen, $C_1$–$C_3$ alkyl, or halogen;

n is 1, 2, or 3;

m is 0 or 1, except that when m is 0, n is other than 0;

X is CO, CHOH, CH=CH, S, or O, except that when n is 0, X is other than S or O;

$R_2$ is hydrogen, hydroxy, $C_1$–$C_3$ alkoxy, or $C_1$–$C_3$ alkanoyloxy; or

a non-toxic pharmaceutically acceptable acid addition salt thereof.

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**4,337,342**

**PROCESS FOR THE PREPARATION OF 3-PICOLINE**

**Rolf Dinkel, Visp, Switzerland, assignor to Lonza Ltd., Gampel/Valais, Switzerland**

**Filed May 12, 1981, Ser. No. 263,042**

**Claims priority, application Switzerland, May 23, 1980, 4052/80**

**Int. Cl.³ C07D *213/09, 213/10, 213/12***

**U.S. Cl. 546—251** **24 Claims**

1. A process for the preparation of 3-picoline which comprises reacting a liquid-phase mixture of acetaldehyde and/or crotonaldehyde with formaldehyde, in the presence of an ammonium salt, at a temperature of 180° to 280° C. in a closed vessel.

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**4,337,343**

**4,5 OR 6-ALKYLAMINOALKYL-2-ALKYL-4,5,6,7-TETRAHYDRO BENZO[D]THIAZOLES**

**Jacques G. Maillard, Versailles; Pierre P. A. Delaunay, Herblay, and Jacky M. G. Legeai, Palaiseau, all of France, assignors to Laboratoires Jacques Logeais, Issy-Les-Moulineaux, France**

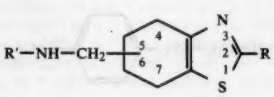
**Filed Jun. 18, 1980, Ser. No. 160,458**

**Claims priority, application France, Jun. 20, 1979, 79 15774**

**Int. Cl.³ C07D *277/60*; A61K *31/425***

**U.S. Cl. 548—152** **3 Claims**

1. A compound selected from the compounds of the general formula (I):



(I)

in which:

the group R′—NH—$CH_2$— is in the 4, 5 or 6 position,

R is selected from hydrogen and $C_{1-6}$ alkyl,

R′ is selected from hydrogen and $C_{1-6}$ alkyl;

and a pharmaceutically acceptable acid addition salt thereof.

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**4,337,344**

**PROCESS FOR THE PREPARATION OF DIBENZOTHIAZYL DISULFIDE**

**Michel J. C. Alicot, Lannemezan, and Adrien P. N. Tignol, Montrejeau, both of France, assignors to PCUK Produits Chimiques Ugine Kuhlmann, Courbevoie, France**

**Filed Jul. 31, 1979, Ser. No. 62,398**

**Claims priority, application France, Aug. 18, 1978, 78 24093**

**Int. Cl.³ C07D *417/12***

**U.S. Cl. 548—158** **7 Claims**

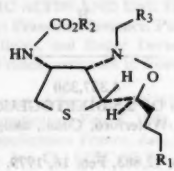
1. A process for the preparation of dibenzothiazyl disulfide by oxidation of an aqueous suspension of mercaptobenzothiazole by means of hydrogen peroxide, which consists in effecting the oxidation in the presence of ethylenediaminetetraacetic acid or an alkali metal salt thereof used at the rate of 0.025 to 1% by weight with respect to the hydrogen peroxide and at a temperature between 10° and 100° C.

## 4,337,345
## PREPARATION OF BIOTIN VIA THIENO [3,2c] ISOXAZOLES

Enrico G. Baggiolini, Nutley; Hsi L. Lee, West Paterson, and Milan R. Uskokovic, Upper Montclair, all of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 75,360, Sep. 13, 1979, abandoned, which is a division of Ser. No. 946,675, Sep. 28, 1978, Pat. No. 4,189,586, which is a division of Ser. No. 822,119, Aug. 5, 1977, Pat. No. 4,130,713. This application Jun. 25, 1981, Ser. No. 277,568
Int. Cl.[3] C07D *515/04*
U.S. Cl. 548—242 4 Claims

1. A compound of the formula:



the enantiomers and racemates thereof, wherein $R_1$ is methyl or $-CH_2OR_4$, where $R_4$ is lower alkyl or benzyl; $R_2$ is lower alkyl and $R_3$ is phenyl, naphthyl, benzyl; said phenyl or naphthyl each are unsubstituted or substituted with a halogen, lower alkylenedioxy having 2 to 5 carbon atoms, lower alkyl or lower alkoxy, with the lower alkyl and lower alkoxy moieties each having 1 to 7 carbon atoms.

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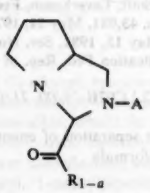
## 4,337,346
## α-HYDROXYALDEHYDE AND A PROCESS FOR PREPARING THE SAME

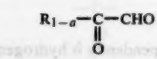
Teruaki Mukaiyama, Tokyo; Yoji Sakito, Musashino, and Masatoshi Asami, Yokohama, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Oct. 30, 1979, Ser. No. 89,356
Claims priority, application Japan, Nov. 2, 1978, 53-135511; Nov. 6, 1978, 53-137147; Jun. 4, 1979, 54-70365; Jun. 4, 1979, 54-70366; Jun. 4, 1979, 54-70367
Int. Cl.[3] C07C *45/56*; C07D *487/04*
U.S. Cl. 548—324 7 Claims

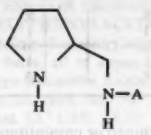
1. A process for preparing an optically active or racemic aminal represented by the formula (I),


(I)

wherein A represents a $C_6$-$C_{14}$ aryl group which may be substituted with a $C_1$–$C_4$ alkyl, $C_1$–$C_4$ alkoxy or a halogen atom and $R_{1-a}$ represents a $C_6$–$C_{14}$ aryl group, which comprises reacting a arylglyoxal represented by the formula,



wherein $R_{1-a}$ is as defined above, with an optically active or racemic 2-(N-substituted aminomethyl)pyrrolidine represented by the formula,



wherein A is as defined above.

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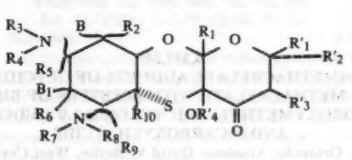
## 4,337,347
## PROCESS FOR PREPARING ANALOGS OF SPECTINOMYCIN

David R. White, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 68,926, Aug. 23, 1979, Pat. No. 4,282,152. This application Dec. 4, 1980, Ser. No. 212,952
Int. Cl.[3] C07D *327/08*
U.S. Cl. 549—16 3 Claims

1. Anomers and asteric mixtures of a compound having the formula:



wherein $R'_1$ through $R'_3$ may be the same or different and are selected from the group consisting of hydrogen, lower alkyl, lower haloalkyl, acyloxy alkyl, lower aminoalkyl, lower alkenyl, lower alkynyl, -OX and -(CHn2)n-OX and isomers thereof with the proviso that $R_1$, $R_2$ and $R_3$ are not hydroxy,

X is selected from the group consisting of hydrogen, lower alkyl, lower alkenyl, and lower alkynyl;

n is an integer of from one to four;

$R_2$, $R_5$, $R_6$, $R_9$ and $R_{10}$ are selected from the group consisting of hydrogen, lower alkyl, lower alkenyl and lower alkynyl; $R_3$, $R_4$, $R_7$ and $R_8$ are selected from the group consisting of hydrogen, alkyl, lower alkenyl, lower alkynyl, and a blocking group selected from the group consisting of aralkoxycarbonyl, halogenated alkoxycarbonyl and alkoxycarbonyl; with the proviso that one of $R_3$ and $R_4$ is always a blocking group and one of $R_7$ and $R_8$ is always a blocking group; $R'_4$ is aroyl, lower alkyl or acyl; and B and $B_1$ are the same or different and are selected from the group consisting of hydrogen, hydroxy, alkoxy, o-lower alkenyl, thio, thio-lower alkyl and thio-lower alkenyl.

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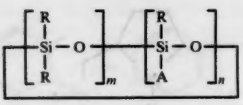
## 4,337,348
## BENZOIN GROUP-CONTAINING CYCLIC ORGANOPOLYSILOXANES AND A METHOD FOR THE PREPARATION THEREOF

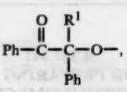
Minoru Takamizawa, Annaka; Fumio Okada, Takasaki, and Hisashi Aoki, Annaka, all of Japan, assignors to Shin-Etsu Chemical Company Limited, Tokyo, Japan

Filed Jun. 17, 1981, Ser. No. 274,631
Claims priority, application Japan, Jun. 20, 1980, 55-83520
Int. Cl.[3] C07F *7/18*
U.S. Cl. 556—436 8 Claims

1. A benzoin group-containing cyclic organopolysiloxane represented by the general structural formula



in which R is a substituted or unsubstituted monovalent hydrocarbon group, A is a benzoin group expressed by the formula



Ph being a phenyl group and $R^1$ being a hydrogen atom or an alkyl group having from 1 to 4 carbon atoms, m is zero or a positive integer and n is a positive integer with the proviso that m+n is 3, 4, 5 or 6.

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**4,337,349**

**DIMETHACRYLATE ADDUCTS OF GLYCIDYL METHACRYLATE WITH DIESTERS OF BIS (HYDROXYMETHYL) TRICYCLO[5.2.1.0 2,6]DECANE AND DICARBOXYLIC ACIDS**

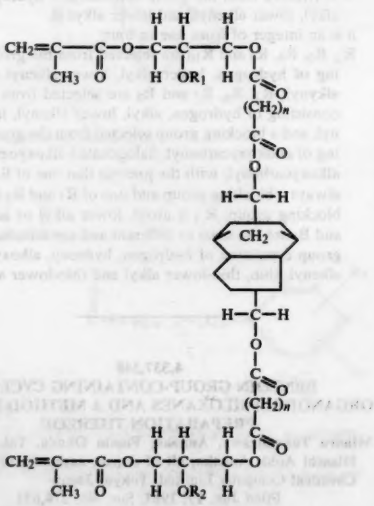
**Jan A. Orlowski, Altadena; David V. Butler, West Covina, and Patrick D. Kidd, Sierre Madre, all of Calif., assignors to Scientific Pharmaceuticals, Inc., Duarte, Calif.**

**Filed Jun. 2, 1980, Ser. No. 155,160**

**Int. Cl.³ C07C *125/065***

**U.S. Cl. 560—30** **7 Claims**

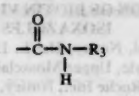
1. A dimethacrylate of the following chemical structure:



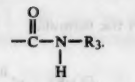
where

n represents a number of 2 to 8;

$R_1$ and $R_2$ are the same or different and are hydrogen or one or more groups of the formula:



where $R_3$ is an aliphatic group of 1–14 carbon atoms, aromatic group of 6–14 carbon atoms or cycloaliphatic having 3 to 14 carbon atoms, and at least one of $R_1$ and $R_2$ is



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**4,337,350**

**REDUCTION OF 2,5-DIKETOGLUCONIC ACID**

**Glenn C. Andrews, Waterford, Conn., assignor to Pfizer Inc., New York, N.Y.**

**Division of Ser. No. 12,683, Feb. 16, 1979, Pat. No. 4,230,880, which is a division of Ser. No. 843,946, Oct. 20, 1977, Pat. No. 4,159,990, which is a continuation-in-part of Ser. No. 749,509, Dec. 10, 1976, abandoned. This application Apr. 25, 1980, Ser. No. 143,585**

**Int. Cl.³ C07C *69/716***

**U.S. Cl. 560—174** **2 Claims**

1. An alkyl-2,5-diketogluconate-5,5-dialkyl acetal wherein each alkyl group is normal alkyl of 1 to 4 carbon atoms.

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**4,337,351**

**PREPARATION OF ETHYLIDENE DIACETATE**

**Thomas H. Larkins, Jr., Kingsport, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.**

**Filed Jan. 30, 1981, Ser. No. 229,816**

**Int. Cl.³ C07C *67/00, 69/16***

**U.S. Cl. 560—263** **3 Claims**

1. Process for the preparation of ethylidene diacetate which comprises hydrogenating acetic anhydride at about 140° to 225° C. and about 300 to 2500 psig in the presence of a catalytic amount of ruthenium on alumina and methyl iodide.

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**4,337,352**

**SEPARATION OF ENANTIOMERS OF CHIRAL CARBOXYLIC ACIDS**

**Klaus Naumann, Cologne, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany**

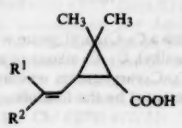
**Continuation of Ser. No. 43,981, May 31, 1979, abandoned. This application May 15, 1981, Ser. No. 263,812**

**Claims priority, application Fed. Rep. of Germany, Jun. 20, 1978, 2826952**

**Int. Cl.³ C07B *19/00, 21/00***

**U.S. Cl. 562—401** **10 Claims**

1. A process for the separation of enantiomers of a chiral carboxylic acid of the formula



wherein

$R^1$ and $R^2$ each independently is hydrogen, alkyl with 1-4 C atoms, halogen, optionally substituted phenyl or optionally substituted phenylmercapto,

comprising reacting an alkali metal salt of the acid with an amount of an optically active phenylglycine ethyl ester salt

which is equivalent to only one enantiomer, in an aqueous weakly alkaline buffered solution as the reaction medium, the reaction medium having a pH value at which the entire acid is present in the ionized form but at which no amine salt is yet deprotonated, whereby the ammonium salt of the one enantiomer precipitates while the alkali metal salt of the other enantiomer remains in solution, and separating the precipitate from the solution.

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4,337,353

## NOVEL CARBOXYLIC ACIDS, BENZOYL PHENYL ALKANOIC ACIDS AND USE THEREOF

André Allais, Gagny; Francois Clemence, Paris; Jean Meier, La Varenne Saint-Hilaire, and Roger Deraedt, Les Pavillons-sous-Bois, all of France, assignors to Roussel UCLAF, Paris, France

Continuation-in-part of Ser. No. 540,382, Jan. 13, 1975, abandoned. This application Feb. 6, 1978, Ser. No. 875,323
Claims priority, application France, Jan. 24, 1974, 74 02386
Int. Cl.³ C07C *59/84*
U.S. Cl. 562—460 3 Claims

1. A compound selected from the group consisting of 6-[3'-(4-chlorobenzoyl)-2'-methyl-phenyl]-hexanoic acid and its non-toxic, pharmaceutically acceptable salts and esters.

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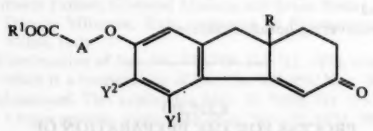
4,337,354

## [(5,6,9A-SUBSTITUTED-3-OXO-1,2,9,9A-TETRAHYDRO-3H-FLUOREN-7-YL)OXY]ALKANOIC AND CYCLOALKANOIC ACIDS, THEIR ANALOGS, ESTERS, SALTS, AND DERIVATIVES

Edward J. Cragoe, Jr., Lansdale; Gerald E. Stokker, Gwynedd Valley, and Norman P. Gould, Lansdale, all of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 86,605, Oct. 19, 1979, abandoned, and a continuation-in-part of Ser. No. 164,708, Jun. 30, 1980, abandoned. This application Feb. 19, 1981, Ser. No. 236,079
Int. Cl.³ C07C *69/94*
U.S. Cl. 562—461 12 Claims

1. A compound of the formula:



wherein R is $C_2$ to $C_4$ alkynyl, branched or unbranched; $R^1$ is H, lower alkyl; lower alkenyl; lower alkynyl; lower cycloalkyl; substituted lower alkyl, where the substituent is carboxy, lower alkoxycarbonyl, oxo, hydroxy, lower alkoxy, halo, lower acyloxy, lower dialkylamino, sulfamoyl, pyridyl, furyl, tetrahydrofuryl, aryl, 1-methylpiperidyl, morpholinyl, pyrrolidinyl, 1-methyl-piperazinyl, and thienyl; substituted cycloalkyl heterocyclic; aryl; $Y^1$ and $Y^2$ are independently Cl and $CH_3$; A is $(CH_2)_2$ or

where $R^2$ is H, methyl or ethyl, $R^3$ is H, F or methyl and $R^2$ and $R^3$, may be joined together to form the ring $>C(CH_2)_n$ where n is the integer 2, 3 or 4; and pharmaceutically acceptable salts thereof.

4,337,355

## PROCESS FOR PREPARING 4-HYDROXYPHENYLACETIC ACID

Kazuhisa Nakajima, Mino; Kazuaki Gohgi, Nishinomiya, and Toshio Yamamoto, Suita, all of Japan, assignors to Nippon Gohsei Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Jun. 20, 1980, Ser. No. 161,592
Int. Cl.³ C07C *65/01*
U.S. Cl. 562—478 9 Claims

1. A process for preparing 4-hydroxyphenylacetic acid which comprises reducing, in the presence of a catalyst, 4-hydroxymandelic acid in a reaction medium consisting essentially of a water-containing lower aliphatic carboxylic acid containing 5 to 50% by weight of water, and recovering the resulting 4-hydroxyphenylacetic acid.

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4,337,356

## CATALYTIC LIQUID-PHASE OXIDATION OF BUTANE

John E. Logsdon, and Ben W. Kiff, So. Charleston, both of W. Va., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Mar. 20, 1980, Ser. No. 132,298
Int. Cl.³ C07C *51/215, 53/08, 55/10*
U.S. Cl. 562—549 5 Claims

1. In a continuous process for the cobalt catalyzed liquid-phase oxidation of butane to acetic acid with oxygen at a pressure of about 200–1000 psig in acetic acid solvent at a temperature of about 80°–150° C. in the presence of an oxidation promoter wherein the cobalt catalyst stream is recycled, the improvement which comprises:

(1) keeping the iron concentration below about 1000 parts per million in the catalyst recycle stream;

(2) limiting the water concentration to a maximum of about 3% based on the weight of the catalyst recycle stream;

(3) maintaining a cobalt acetate concentration of at least about 0.1% but no more than 3% based on the weight of the reaction mixture; and

(4) continuously removing succinic acid by-product whereby a level below the saturation point of succinic acid is maintained in the reaction media.

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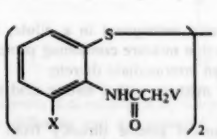
4,337,357

## HERBICIDAL DITHIO-BIS(HALOACETANILIDES)

Tamon Uematsu, Toyonaka; Shunichi Hashimoto, Takarazuka, and Hiromichi Oshio, Minoo, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Division of Ser. No. 28,801, Apr. 10, 1979, Pat. No. 4,268,301. This application Oct. 24, 1980, Ser. No. 200,339
Claims priority, application Japan, Apr. 17, 1978, 53-45766; Oct. 13, 1978, 53-126378
Int. Cl.³ A01N *9/12*; C07C *103/38*
U.S. Cl. 564—151 4 Claims

1. A compound of the formula (VIII):



wherein each of X and V is a halogen atom.

## 4,337,358
## PROCESS FOR OXIDIZING PRIMARY AMINES TO OXIMES BY ELEMENTAL OXYGEN

John N. Armor, Morris Plains, N.J., assignor to Allied Corporation, Morristown, N.J.

Continuation-in-part of Ser. No. 164,463, Jun. 30, 1980, abandoned. This application Apr. 13, 1981, Ser. No. 254,000
Int. Cl.³ C07C *131/04, 131/00*
U.S. Cl. 564—267 5 Claims

1. Process for conversion of primary saturated aliphatic and alicyclic amines having between 2 and 12 carbon atoms in the molecule to oximes, comprising contacting said amine in vapor phase with elemental oxygen and with essentially only unreactive diluent vapors or gases at amine concentration and oxygen concentration outside the explosive limits; and with a silica gel catalyst having surface area of between about 50 and about 1000 $m^2/g$; at absolute pressure between about 10 and 1,000 kPa; and at temperature between about 120° C. and about 250° C.; and at contact time of the heated gaseous reactants with the catalyst between about 0.1 and 10 seconds.

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## 4,337,359
## PREPARATION OF DIMETHYL POLYSULPHIDES

Hermann Arold, Wuppertal; Siegbert Humburger, Leverkusen; Hans-Joachim Diehr, Wuppertal, and Helmut Porkert, Baytown, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Mar. 30, 1981, Ser. No. 249,241
Claims priority, application Fed. Rep. of Germany, Apr. 5, 1980, 3013396
Int. Cl.³ C07C *148/00*
U.S. Cl. 568—21 10 Claims

1. A process for the preparation of a dimethyl polysulphide of the formula

$$CH_3—S_x—CH_3$$

in which x is from 1 to 5, comprising reacting a polysulphide of the formula

$$M_yS_x$$

in which
M represents an alkali metal atom or alkaline earth metal atom, and
y is 1 or 2,
with O,O,O-trimethyl thiophosphate of the formula

$$(CH_3O)_3P=S.$$

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## 4,337,360
## PROCESS FOR PREPARING METHYLVANILLYL KETONE FROM ISOEUGENOL

Meyer Sletzinger, North Plainfield, N.J., assignor to Merck & Co., Inc., Rahway, N.J.

Filed Sep. 28, 1979, Ser. No. 79,748
Int. Cl.³ C07C *45/42*
U.S. Cl. 568—322 4 Claims

1. A through process for preparing methylvanillyl ketone which comprises:
(1) oxidation of a protected isoeugenol in a dilute, inert solvent to obtain a reaction mixture containing protected isoeugenol epoxide as an intermediate therein;
(2) treating said reaction mixture with a strong acid in an inert solvent; and
(3) recovering methylvanillyl ketone directly from said acid-treated reaction mixture without isolating said protected isoeugenol epoxide intermediate.

## 4,337,361
## LIQUID PHASE SYNTHESIS OF HEXAFLUOROACETONE

Louis G. Anello, Hamburg; Michael Van Der Puy, Cheektowaga; Martin A. Robinson, East Amherst, and Richard E. Eibeck, Orchard Park, all of N.Y., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed Feb. 27, 1981, Ser. No. 238,920
Int. Cl.³ C07C *45/56*
U.S. Cl. 568—386 10 Claims

1. A process for the preparation of hexafluoroacetone which comprises contacting, in the liquid phase, hexafluorothioacetone dimer in the presence of an aprotic solvent containing a catalytic amount of an alkali metal fluoride with a gaseous oxidant selected from the group consisting of air, $O_2$, $O_3$, $NO_2$ and NO.

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## 4,337,362
## CONVERSION OF HEXAFLUOROTHIOACETONE DIMER INTO HEXAFLUOROACETONE

Louis G. Anello, Hamburg, N.Y., assignor to Allied Corporation, Morris Township, Morris County, N.J.

Filed Jun. 8, 1981, Ser. No. 271,456
Int. Cl.³ C07C *45/56*
U.S. Cl. 568—386 14 Claims

1. A method of preparing hexafluoroacetone which consists essentially of:
(a) reacting, in the liquid phase, hexafluorothioacetone dimer with at least about a stoichiometric amount of an aprotic solvent selected from the group consisting of dimethylacetamide, dimethylformamide, dimethyl sulfoxide and N-methyl pyrrolidone and at least a catalytic amount of a member selected from the group consisting of LiF, NaF, KF, CsF and $RSO_3H$ wherein R is an organic radical selected from the group consisting of straight and branched chain alkyl having from one to six carbon atoms, aryl having from six to ten carbon atoms, monoalkylaryl wherein aryl contains six to ten carbon atoms and alkyl contains one to fourteen carbon atoms and dialkylaryl wherein each alkyl group contains one to six carbon atoms;
(b) maintaining the reacting temperature above about 90° C.; and
(c) recovering hexafluoroacetone.

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## 4,337,363
## PROCESS FOR THE PREPARATION OF 3-(4-METHYL-3-CYCLOHEXEN-1-YL) BUTYRALDEHYDE

Helmut Bahrmann, Hünxe; Boy Cornils, Dinslaken; Carl D. Frohning, and Jürgen Weber, both of Oberhausen, all of Fed. Rep. of Germany, assignors to Ruhrchemie Aktiengesellschaft, Oberhausen, Fed. Rep. of Germany

Filed Aug. 24, 1979, Ser. No. 69,659
Claims priority, application Fed. Rep. of Germany, Aug. 28, 1978, 2837480
Int. Cl.³ C07C *45/50*
U.S. Cl. 568—444 9 Claims

1. In a process for the preparation of 3-(4-methyl-3-cyclohexen-1-yl)butyraldehyde by hydroformylation of limonene in the presence of a catalyst containing a metal of Group VIII of the Periodic Table, the improvement wherein a rhodium carbonyl complex containing additionally a triphenyl and/or trialkyl phosphine as ligands is used as catalyst and the reaction is conducted at a pressure of 100 to 350 bars and at a temperature of 110° to 160° C., the triphenyl or trialkyl phosphines or mixtures thereof being present in an amount of 10 to 50 moles per gram atom of rhodium in the reaction mixture.

4,337,364

## OLEFIN OXIDATION WITH SUPPORTED CUO CATALYST

Paul W. Solomon, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jan. 23, 1981, Ser. No. 228,037
Int. Cl.[3] C07C *45/35, 47/20*
U.S. Cl. 568—475 4 Claims

1. A method for preparing aldehyde from olefin comprising contacting said olefin with an oxygen containing gas at a temperature in the range of about 350° C. to about 500° C. in the presence of a catalyst produced by the method comprising (1) impregnating a support with an aqueous solution of cupric oxide, (2) subjecting the impregnated support to a temperature in the range of about 90° C. to about 150° C. for a time sufficient to produce a dry powder thereby providing a catalyst consisting essentially of a support impregnated with about 0.1 to about 5 weight percent cupric oxide.

4,337,365

## PROCESS FOR THE SELECTIVE HYDROFORMYLATION OF METHANOL TO ACETALDEHYDE

Wellington E. Walker, deceased, late of Sissonville, W. Va. by Maxine M. Walker, administratrix, assignor to Union Carbide Corporation, Danbury, Conn.

Continuation-in-part of Ser. No. 138,678, Apr. 9, 1980, abandoned. This application Feb. 17, 1981, Ser. No. 233,971
Int. Cl.[3] C07C *45/49, 47/06*
U.S. Cl. 568—487 13 Claims

1. In a process for selectively producing acetaldehyde from the reaction of methanol, hydrogen and carbon monoxide at a pressure of from 1,000 psig to 10,000 psig and a $H_2$:CO mole ratio of from 1:10 to 10:1 and wherein the reaction is catalyzed by a catalyst system consisting essentially of cobalt and iodide, the improvement consisting of carrying out the reaction at a temperature of from 100° C. to 180° C. in the presence of a substantially inert solvent from the group of dioxane, tetrahydrofuran, the dimethyl ether of tetraethylene glycol and 1,2-dimethoxybenzene at an iodide to cobalt mole ratio of from 2:1 to 100:1 and wherein the volume ratio concentration of said inert solvent to methanol is from 0.5:1 to 100:1.

4,337,366

## METHOD FOR THE PREPARATION OF ETHERS

Vittorio Fattore; Giovanni Manara, and Bruno Notari, all of San Donato Milanese, Italy, assignors to Snamprogetti S.p.A., Milan, Italy

Continuation of Ser. No. 879,769, Feb. 21, 1978, abandoned, which is a continuation of Ser. No. 633,859, Nov. 20, 1975, abandoned. This application Mar. 10, 1980, Ser. No. 129,163
Claims priority, application Italy, Nov. 21, 1974, 29683 A/74
Int. Cl.[3] C07C *41/09*
U.S. Cl. 568—698 16 Claims

1. A method for the preparation of aliphatic ethers comprising dehydrating an aliphatic alcohol at a temperature between 200° and 400° C. in the presence of a catalyst produced by the steps of:

(a) reacting active alumina with a silicon compound of general formula

wherein X, Y, Z, and W are each selected from the group consisting of —R, —OR, —Cl, —Br, —$SiH_3$, —COOR and —$SiH_nCl_m$, R is a hydrogen atom of an alkyl, cycloalkyl, aryl, alkyl-aromatic or alkyl-cycloalkyl radical having from 1 to 30 carbon atoms and m and n are integers of from 1 to 3;

(b) drying the product of step (a); and

(c) calcining in air the dried product of step (b) thereby depositing on said alumina from 0.5% to 20% by weight, calculated on the final overall weight of said catalyst, of silica formed by the above reaction.

4,337,367

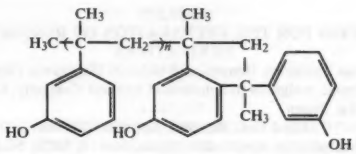
## OLIGOMER OF M-ISOPROPENYLPHENOL

Shuichi Kanagawa, Osaka; Shinji Nakao, Sakai; Kiyoshi Nakai; Kunimasa Kamio, both of Toyonaka; Shunsuke Matsushima, Otsu; Kazuhiko Hata, Niihama, and Kentaro Mashita, Ibaraki, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

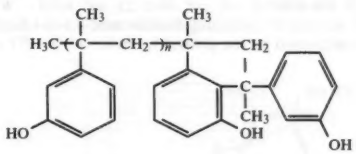
Division of Ser. No. 909,785, May 26, 1978, Pat. No. 4,221,715. This application Dec. 26, 1979, Ser. No. 106,845
Claims priority, application Japan, May 27, 1977, 52-62407
Int. Cl.[3] C07C *39/12, 39/06*
U.S. Cl. 568—720 8 Claims

1. A process for producing an oligomer of m-isopropenylphenol which comprises subjecting m-isopropenylphenol to thermal polymerization in the absence of a catalyst.

6. A process for producing an oligomer of m-isopropenylphenol having a number average molecular weight of about 270 to about 540, and having the formulae



and/or



wherein n is a mean value satisfying the equation $o<n\leqq 2$ comprising subjecting m-isopropenylphenol to thermal polymerization in the absence of a catalyst.

4,337,368

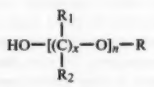
## REAGENT AND METHOD FOR DECOMPOSING HALOGENATED ORGANIC COMPOUNDS

Louis L. Pytlewski; Kenneth Krevitz, both of Philadelphia, Pa., and Arthur B. Smith, Littleton, Colo., assignors to The Franklin Institute, Philadelphia, Pa.

Continuation-in-part of Ser. No. 142,865, Apr. 21, 1980. This application Jun. 11, 1980, Ser. No. 158,359
Int. Cl.[3] C07C *39/12*
U.S. Cl. 568—730 23 Claims

1. A method for the decomposition of a halogenated organic compound, comprising the steps of:

(a) providing a reaction mixture comprising the halogenated compound, a reactant having the general formula



wherein R is hydrogen or lower alkyl, $R_1$ and $R_2$ are the same or different and are selected from the group consisting of hydrogen, unsubstituted or substituted lower alkyl, unsubstituted or substituted cycloalkyl having from 5 to 8 carbon

atoms, and unsubstituted or substituted aryl, n has a value of from 2 to about 400, and x has a value of at least 2, and an alkali metal; and

(b) reacting said reactant with said alkali metal and oxygen to form a decomposition reagent, which effects substantially complete removal of halogen from said halogenated compound and forms an oxygenated derivative of said compound.

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**4,337,369**

## METHOD OF DECOLORIZING MIXTURES OF T-BUTYL ALKYLPHENOLS

**Steven H. Vanderpool, Austin, and Ernest L. Yeakey, Houston, both of Tex., assignors to Texaco Inc., White Plains, N.Y.**

**Filed Jan. 30, 1981, Ser. No. 229,822**

**Int. Cl.³ C07C *37/68, 39/04***

**U.S. Cl. 568—756** **11 Claims**

1. A method for decolorizing a mixture of t-butyl alkylphenols derived by reacting a mono alkylphenol with isobutylene where the mono alkylphenol is made over an anionic ion-exchange resin catalyst comprising reacting the mixture with a portion of trioxane in a homogeneous liquid phase reaction.

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**4,337,370**

## PROCESS FOR THE PREPARATION OF RESORCINOL DERIVATIVES

**Yukihisa Takisawa, Ibaraki, and Shinichi Hasegawa, Otsu, both of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan**

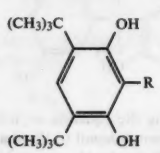
**Filed Oct. 29, 1980, Ser. No. 201,746**

**Claims priority, application Japan, Nov. 8, 1979, 54-145060; Dec. 10, 1979, 54-160180**

**Int. Cl.³ C07C *37/11, 39/08***

**U.S. Cl. 568—766** **6 Claims**

1. A process for preparing 2-substituted-4,6-di-t-butylresorcinol represented by the general formula:




wherein R represents a straight or branched alkyl group having 1 to 20 carbon atoms, a straight or branched alkenyl group having 2 to 20 carbon atoms and at least one double bond, or an aralkyl group, but the tertiary carbon of R is free from direct bonding to the nucleus which comprises allowing 4,6-di-t-butylresorcinol to react with a halogen compound represented by the general formula:

RX

wherein R has the same meaning as defined above and X represents a halogen atom, excluding the X bonded to the tertiary carbon of R, in an aqueous alkali solution.

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**4,337,371**

## PRODUCTION OF ETHYLENE GLYCOL BY REACTION OF METHANOL, AN ORGANIC PEROXIDE AND FORMALDEHYDE

**John Kollar, Wyckoff, N.J., assignor to Celanese Corporation, New York, N.Y.**

**Filed Sep. 2, 1980, Ser. No. 183,537**

**Int. Cl.³ C07C *31/20***

**U.S. Cl. 568—852** **8 Claims**

1. In a process for producing ethylene glycol by reacting methanol, an organic peroxide, and formaldehyde in the presence of water, said organic peroxide having the formula R-O-O-$R^1$ wherein R and $R^1$ each is an alkyl or aralkyl group containing 3 to 12 carbon atoms, the improvement comprising utilizing no more than about 6 weight percent of organic peroxide and an amount of water ranging from about 0.5 to about 35 weight percent, based on the total weight of methanol, organic peroxide, formaldehyde and water present, in the initial reaction mixture.

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**4,337,372**

## METHOD FOR THE CIS TO TRANS ISOMERIZATION OF AN ALKENOL

**Toshinobu Ishihara; Akira Yamamoto, and Kenichi Taguchi, all of Joetsu, Japan, assignors to Shin-Etsu Chemical Company Limited, Tokyo, Japan**

**Filed May 22, 1981, Ser. No. 266,615**

**Claims priority, application Japan, May 26, 1980, 55-69723**

**Int. Cl.³ C07C *29/56***

**U.S. Cl. 568—906** **4 Claims**

1. A method for the isomerization of a cis-isomer of an ethylenically unsaturated aliphatic alcohol represented by the general formula

$$CH_3(CH_2)_mCH{=}CH(CH_2)_nOH$$

in which m and n are each an integer from 1 to 10 inclusive, into the trans-isomer which comprises heating the cis-isomer in the presence of selenium metal.

4,337,373

## FURNACE FOR FUSING VANADIUM PENTOXIDE POWDER

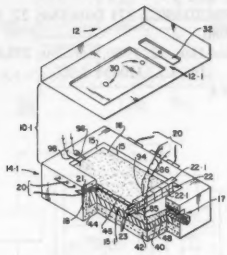
Michael B. Fletcher, Pretoria, South Africa, assignor to Union Carbide Corporation, Danbury, Conn.

Filed Jan. 17, 1980, Ser. No. 113,098

Claims priority, application South Africa, Jan. 22, 1979, 79/0247

Int. Cl.[3] H05B *3/60*

U.S. Cl. 373–120 15 Claims



1. A furnace comprising a body defined by walls extending upwardly from a bottom and adapted to contain an electrically conductive melt and having electrode ports extending downwardly at a slope through its walls, and having an overflow weir leading out of the body; a removable cover adapted to seat on the body and having a feed opening through which a particulate material may be fed into the body when the furnace is in operation; electrode rods extending downwardly through the electrode ports into the melt to a level below the level of the weir but clear of the bottom of the body; a power supply and means for electrically connecting said electrode rods to said power supply, the power supply being adapted to supply a substantially constant power to the electrode rods; feed means operatively mounted in relation to the feed opening in the cover, the feed means being adapted in operation to feed particulate material into the body; melt temperature sensing means adapted to sense the temperature of the melt and to provide a signal in response to variations of the melt temperature beyond a predetermined maximum or minimum value; and feed control means responsive to the signal from the melt temperature sensing means to automatically adjust the melt temperature within predetermined limits by controlling the rate of feed of particulate material onto the surface of the melt.

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4,337,374

## SERVICE WIRE SPLICE ENCLOSURE

Donald J. Smith, Woodland Hills, Calif., assignor to Communications Technology Corporation, Los Angeles, Calif.

Filed Jan. 26, 1981, Ser. No. 228,242

Int. Cl.[3] H02G *15/00*

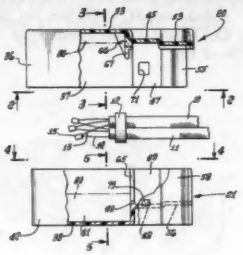
U.S. Cl. 174—138 F 14 Claims

1. An enclosure for an electric cable splice, comprising:

a first generally rectangular shell having a main section, an intermediate section and an entrance section; and

a second generally rectangular shell having a main section, an intermediate section and an entrance section;

with one of said shells sliding over the other of said shells bringing said main sections together to form a main compartment, said intermediate sections together to form an



intermediate compartment, and said entrance sections together to form an entrance passage.

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4,337,375

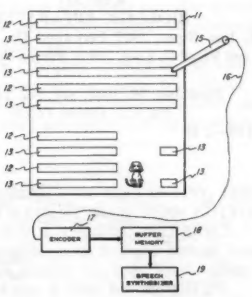
## MANUALLY CONTROLLABLE DATA READING APPARATUS FOR SPEECH SYNTHESIZERS

Alfred B. Freeman, Emporia, Kans., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Jun. 12, 1980, Ser. No. 158,801

Int. Cl.[3] G10L *1/00*

U.S. Cl. 179—1 SA 36 Claims




1. A speaking apparatus adapted to cooperate with a display material said display material having affixed thereto visual data and associated digitally coded speech data, said apparatus comprising;

pickup means for sensing said digitally coded speech data, and for producing digital output signals identifying speech sounds;

a speech synthesizer including means for storing sets of compressed data, each such set corresponding to one of said speech sounds, and electronic circuit means responsive to any of said sets of compressed data to audibly produce the corresponding speech sound; and

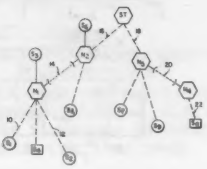
means responsive to said digital output signals to select sets of compressed data for controlling the operation of said electronic circuit means, the selected sets of compressed data corresponding to the speech sounds identified by said digital output signals.

**4,337,376**

## COMMUNICATIONS SYSTEM AND NETWORK

**Elliot L. Gruenberg, West New York, N.J., assignor to Broadcom, Incorporated, West New York, N.J.**

**Filed Dec. 31, 1979, Ser. No. 108,552**
**Int. Cl.³ H04M *11/00*; H04B *7/14, 7/20, 17/00***
**U.S. Cl. 179—2 EB** **16 Claims**



1. A communications system having at least one retrodirective node station and at least a pair of subscriber stations for establishing a communications link between said subscriber stations to permit said subscriber stations to interchange information comprising means for establishing first and second interdependent retrodirective oscillating loops between respectively one of said subscriber stations and said retrodirective node and said other subscriber station and said retrodirective node by controlling the energy characteristics of the link between the first subscriber station and the retrodirective node for combination with the energy characteristic of the link between the second subscriber station and the retrodirective node to bring about the substantially simultaneous establishment of said first and second retrodirective oscillating loops, and means in said retrodirective node for receiving information directed to said subscriber stations whereby said subscriber stations can interchange information.

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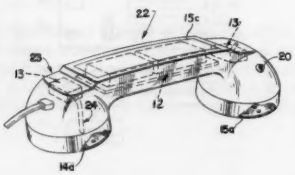
**4,337,377**

## BIOLOGIC APPARATUS

**Wilbur E. Van Riper, 2902 Fernwood Dr., Santa Ana, Calif. 92706, and Virgil R. Laul, 709 S. Parton St., Santa Ana, Calif. 92701**

**Filed Jan. 10, 1980, Ser. No. 110,981**
**Int. Cl.³ H04M *11/06***
**U.S. Cl. 179—2 R** **12 Claims**



1. A self-contained biologic unit having a physical configuration that is substantially similar to the physical configuration of a telephone handset;

said composite biologic unit including converting means, comprising a sound transducer, for converting biologic signals to corresponding sound signals adapted to be transmitted over a telephone system; and

sound-tube means for conducting sounds from said sound producer to the mouthpiece of said telephone handset.

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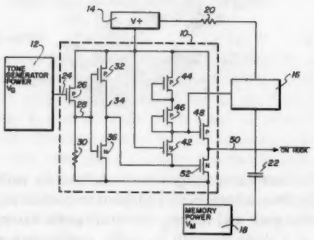
**4,337,378**

## ON-HOOK/OFF-HOOK DETECTOR CIRCUIT

**Harold L. Davis, The Colony, Tex., assignor to Mostek Corporation, Carrollton, Tex.**

**PCT No. PCT/US80/01699, § 371 Date Dec. 22, 1980, § 102(e) Date Dec. 22, 1980**
**PCT Filed Dec. 22, 1980, Ser. No. 273,842**
**Int. Cl.³ H04M *3/22***
**U.S. Cl. 179—18 FA** **10 Claims**



1. An on-hook/off-hook detector circuit comprising:

a series combination of a resistor and a capacitor connected together at a junction node, the combination connected between first and second power terminals, and serving as a time delay;

means for providing a current path from said junction node to said second power terminal when a status signal is at a first state and for opening said current path when said status signal is at a second state wherein the voltage at said junction node approaches the voltage of said first power terminal as said capacitor is charged when said current path is open;

means for clamping said junction node at a first preset voltage when said current path is provided between said junction node and said second power terminal; and

means for driving an output terminal from a first state to a second state when the voltage at said junction node reaches a second preset voltage.

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**4,337,379**

## PLANAR ELECTRODYNAMIC ELECTROACOUSTIC TRANSDUCER

**Takao Nakaya, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan**

**Filed Jan. 2, 1980, Ser. No. 109,111**
**Claims priority, application Japan, Jan. 16, 1979, 54-3639; Jan. 18, 1979, 54-4286[U]**
**Int. Cl.³ H04R *9/00***
**U.S. Cl. 179—115.5 PV** **11 Claims**

1. A planar type electroacoustic transducer comprising:

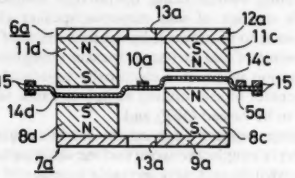
a diaphragm having two surfaces;

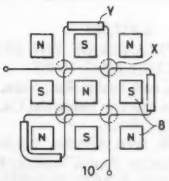
at least one set of magnet means facing one of the surfaces of said diaphragm at a distance sufficient to render this surface to lie within magnetic fields generated by said magnet means,

said magnet means having, at its surface facing the diaphragm, a plurality of spaced magnetic poles arranged in a matrix shape of columns and rows so that the respective adjacent poles are mutually different; and

an electric conductor provided on the diaphragm so as to form a current path continuously extending in alternate directions of a column and a row at sites corresponding to the spaces defined between respective ones of said magnetic poles

without continuously passing by any two magnetic poles of a same column or row, while causing magnetic flux generated between adjacent ones of the respective magnetic poles to traverse respective portions of the current path at right angle and in substantially a same direction with respect to a direction of a current flow in the current path,




said electric conductor having enlarged portions at such sites of the current path as correspond to outer marginal regions of outermostly located ones of the magnetic poles in the matrix form to provide a small impedance at the portions.

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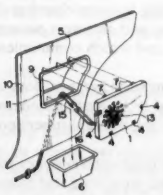
**4,337,380**

## STRUCTURE FOR MOUNTING SPEAKER

**Hisao Tezuka, and Hiroshi Furui, both of Toda, Japan, assignors to Clarion Co., Ltd., Tokyo, Japan**

**Filed Jul. 16, 1980, Ser. No. 169,239**
**Claims priority, application Japan, Jul. 18, 1979, 54/97946[U]**
**Int. Cl.³ H04R *1/02***
**U.S. Cl. 179—146 E** **2 Claims**



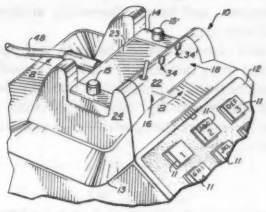

1. A structure for mounting a speaker which comprises:
a speaker;
a base member with said speaker fixed thereto;
a plurality of engaging portions formed on said base member;
a pocket portion formed on a vertical wall and having a flange portion;
U-shaped spring members;
each of said U-shaped spring members being adapted to engage at one end thereof with said flange portion and at another end thereof with the corresponding engaging portion.

**4,337,381**

## CLIP-ON ELECTRIC LOCK AND SWITCHING DEVICE FOR TELEPHONE

**Jeffrey D. Stein, 3528 Merrimac Ave., San Diego, Calif. 92117**

**Filed Mar. 11, 1980, Ser. No. 129,387**
**Int. Cl.³ H04M *1/21***
**U.S. Cl. 179—178** **10 Claims**



1. For a telephone having a cradle, said cradle including a ledge above which a handset is to be placed, a device to be interconnected at said cradle to permit control of the operation of the telephone, said control device comprising;
a housing for receiving the telephone handset thereupon, said housing having a top and a bottom,
the bottom of said housing being positionable adjacent said cradle ledge and the top of said housing having an arcuate ridge extending completely across a first end thereof to form a substantially uniform extension and completion of the outline of a corresponding first end of said cradle,
circuit means being located within said housing and electrically connected to the circuits of said telephone to permit selective control of the operation thereof,
switch means extending through said acruate ridge and electrically interconnected with said circuit means, said switch means being selectively operable to activate said circuit means and thereby control the operation of said telephone circuits, and
indicating means extending through said arcuate ridge and electrically interconnected with said circuit means in order to provide a visual indication when said switch means is operated and said circuit means is activated.

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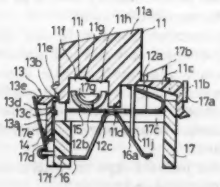
**4,337,382**

## MECHANISM FOR PREVENTING THE SIMULTANEOUS LOCKING OF PUSH BUTTONS IN A PUSH-BUTTON SWITCH DEVICE

**Akihiko Inoue, and Shigekata Sugiura, both of Soma, Japan, assignors to Alps Electric Co., Ltd., Tokyo, Japan**

**Filed Sep. 5, 1980, Ser. No. 184,292**
**Claims priority, application Japan, Sep. 8, 1979, 54-124339[U]**
**Int. Cl.³ H01H *9/20***
**U.S. Cl. 200—5 E** **1 Claim**




1. In a push button switch including a plurality of push buttons, a mechanism for preventing adjacent push buttons from being activated simultaneously, the improvement comprising;

spring means engaging said push buttons for urging them in a direction opposite to the depressing direction;

locking means for locking any one of said push buttons in the depressed state; and

means including a cam for preventing simultaneous locking of two adjacent push buttons, said cam having nearly a semicircular shape in cross section and notches at positions corresponding to the positions of said push buttons, said notches having a width greater than the width of said push buttons, and being alternately arrayed on opposite sides of said cam;

wherein said cam is disposed beneath said push buttons and is adapted to be turned when it is depressed by any one of said push buttons and cannot be turned when it is simultaneously depressed by two neighboring push buttons thereby to restrict the quantity of depression by the push buttons.

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**4,337,383**

## EARPHONE JACK FOR TAPE RECORDERS

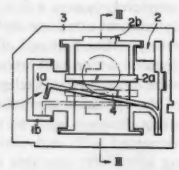
**Masaaki Daigaku, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan**

**Filed Apr. 30, 1980, Ser. No. 145,247**

**Claims priority, application Japan, May 25, 1979, 54/70356[U]**

**Int. Cl.³ H01H *1/28***

**U.S. Cl. 200—51.09** **5 Claims**




1. An earphone jack for tape recorders, into which an earphone plug is insertable, comprising:

a housing having an earphone plug insertion hole and a pair of recesses, one recess being at one side of the housing and the other recess being at the other side of the housing;

an earphone/speaker changeover switch disposed in said housing and having a movable contact which is moved responsive to inserting the earphone plug into said insertion hole of said housing;

a muting switch disposed in said housing and having a fixed contact and a movable contact which are mounted in respective recesses of said housing so that they are fixedly mounted relative to said housing, said movable contact of said muting switch being operatively coupled to said movable contact of said earphone/speaker changeover switch so as to be movable by the movement of said movable contact of said earphone/speaker changeover switch to a position where it is electrically contacted with said fixed contact of said muting switch to cause said muting switch to be turned ON; and

an insulating member disposed in said housing and being operatively coupled between said movable contact of said muting switch and said movable contact of said earphone/speaker changeover switch, said movable contact of said earphone/speaker changeover switch moving said movable contact of said muting switch through said insulating member.

2. An earphone jack for tape recorders, into which an earphone plug is insertable, comprising:

a housing having an earphone plug insertion hole and a pair of recesses, one recess being at one side of the housing and the other recess being at the other side of the housing;

an earphone/speaker changeover switch disposed in said housing and having a movable contact which is moved responsive to inserting of the earphone plug into said insertion hole of said housing;

a muting switch disposed in said housing and having a fixed contact and a movable contact which are mounted in respective recesses of said housing so that they are fixedly mounted relative to said housing, said movable contact of said muting switch being operatively coupled to said movable contact of said earphone/speaker changeover switch so as to be movable by the movement of said movable contact of said earphone/speaker changeover switch to a position where it is electrically separated from said fixed contact of said muting switch to cause said muting switch to be turned OFF; and

an insulating member disposed in said housing and being operatively coupled between said movable contact of said muting switch and said movable contact of said earphone/speaker changeover switch, said movable contact of said earphone/speaker changeover switch moving said movable contact of said muting switch through said insulating member.

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**4,337,384**

## COOKING APPLIANCE OF THE HOT AIR CIRCULATING TYPE

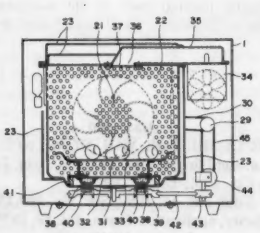
**Junzo Tanaka, Fujiidera, and Toshio Kai, Nara, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan**

**Filed Jul. 30, 1980, Ser. No. 173,905**

**Claims priority, application Japan, Aug. 1, 1979, 54-98937; Aug. 2, 1979, 54-99045; Aug. 2, 1979, 54-99046; Sep. 12, 1979, 54-116981**

**Int. Cl.³ H05B *6/68***

**U.S. Cl. 219—10.55 B** **10 Claims**




1. A cooking appliance employing hot air circulation comprising:

an oven body having an oven chamber therein and having a door for opening and closing a passage through a wall of said oven body and which communicates with said chamber;

a tray removably mounted on a bottom wall of said chamber for holding food to be heated thereon;

said oven body having a compartment positioned adjacent to said chamber;

a partitioning wall positioned between said chamber and said compartment and separating said chamber from said compartment;

a heater means positioned within said compartment for providing heat energy to said chamber;

a fan means positioned within said compartment and operatively associated with said heater means for circulating air heated by said heater means through said chamber;

said partitioning wall having at least one inlet perforation through a central area thereof for circulating air from said chamber to said fan means and having at least one outlet perforation through a peripheral area thereof for circulating air from said fan means to said chamber;

a first control means for controlling the rotational speed of said fan;

a second control means for controlling the amount of heating provided by said heater means; and

a third control means operatively associated with said first and second control means for controlling said second control means in response to the rotational speed of said fan.

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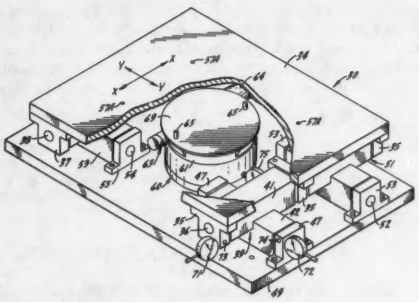
## 4,337,385

## ORBITAL TOOL SUPPORT SYSTEM FOR EDM MACHINES AND OTHER MACHINE TOOLS

**Nicholas Maropis, Phoenixville, Pa., and Matt Kubistant, Brookfield, Ill., assignors to UTI Corporation, Collegeville, Pa.**

**Filed May 11, 1977, Ser. No. 795,726**
**Int. Cl.³ B23P 1/12**
**U.S. Cl. 219—69 V** **6 Claims**



1. An orbital tool support system for a machine tool, such as an EDM machine, of the kind comprising a base, a tool head mounted for vertical movement relative to a workpiece positioned on the base, and a tool head drive, the tool support system comprising:

an orbiting head including an upper head element, a lower head element, and orbital drive means, interconnecting the two head elements, for driving the two head elements horizontally in orbital motion relative to each other;

a machine mounting plate;

first mounting means for affixing the machine mounting plate in centered relation upon the tool head of the machine;

a tool mounting plate;

tool mounting means for rigidly mounting one or more tool elements in fixed position on the tool mounting plate;

a plurality of bearing assemblies, interconnecting the two mounting plates at spaced peripheral locations, the bearing assemblies conjointly maintaining the two mounting plates parallel to each other and in fixed relative vertical positions but permitting limited horizontal movement therebetween;

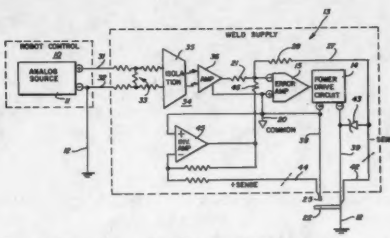
and the orbiting head being mounted centrally between the two mounting plates with the upper head element affixed to the machine mounting plate to preclude horizontal movement relative thereto and the lower head element affixed to the top of the tool mounting plate, so that eccentric vertical forces to which the tool elements are subjected during operation of the machine tool are transmitted directly from the tool mounting plate to the machine mounting plate, through the bearing assemblies, bypassing the orbiting head.

## 4,337,386

## WELDER CONTROL

**Alan L. Kilty, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.**

**Filed Jan. 21, 1980, Ser. No. 113,989**
**Int. Cl.³ B23K 9/10**
**U.S. Cl. 219—130.21** **5 Claims**




1. In an automatic control for a welder having

a controlled power drive circuit **14** with positive and negative outputs,

a source of analog control signal **11** referred to ground **12**,

an error amplifier **15** isolated from ground having signal inputs connected with said analog control signal source **11** and an output connected with said power drive circuit **14**,

a common signal connection **20,26** between the positive output of the power drive circuit and one of the inputs of said error amplifier, said common signal connection being isolated from the control signal ground reference **12**,

said welder control having a first operating mode in which the positive power drive output is connected with a grounded workpiece **22** and the negative power drive output is connected with a welding gun **25** and a second operating mode in which the positive power drive output is connected with the welding gun **25** and the negative power drive output is connected with the grounded workpiece **22**, the improvement comprising:

an analog signal isolator **34** connected between said analog signal source **11** and the input of said error amplifier **15**, said isolator coupling the analog control signal from said source to said error amplifier and blocking a circulating current from said power drive circuit through the common signal connection **20,26** and ground **12** in said second operating mode;

a signal feedback circuit with sensing circuits **42,44** connected from said workpiece **22** and said welding gun **25** to said error amplifier **15**; and

a Zener diode **43** connected between the negative output of said power drive circuit and the sensing circuit connected therewith for providing a feedback signal in the event the sensing circuit connection is interrupted.

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## 4,337,387

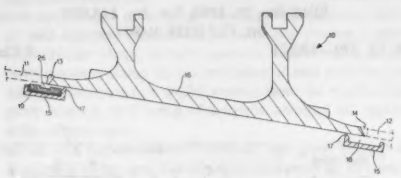
## BACKING SUPPORT STRIP FOR WELDING

**Philip K. Hockney, Smithfield, Australia, assignor to Hockney Engineering Pty. Ltd., New South Wales, Australia**

**Filed Jul. 17, 1980, Ser. No. 169,585**
**Int. Cl.³ B23K 9/02, 5/22**
**U.S. Cl. 219—160** **4 Claims**

1. An extruded metal strip having longitudinal sides adapted to be welded to an adjacent strip of metal abutting one of said sides, said strip having a main body portion with said one side, a backing support portion formed integral with the body portion so as to be joined thereto by a longitudinal rupturable web, said web having a variable thickness so as to have a longitudinally extending groove along which the web ruptures, said support portion having a longitudinal recess to receive a backing strip for the weld to be formed on said one side, said recess being substantially co-extensive with said one side and extend-

ing laterally on both sides thereof so that a backing strip located therein will prevent said support portion being welded to



said main body portion thus enabling removal of the support portion and backing strip upon completion of the weld by the rupture of said web along said groove.

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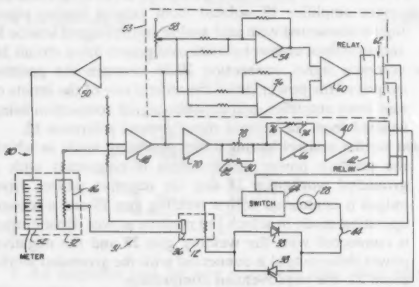
**4,337,388**

## RAPID-RESPONSE WATER HEATING AND DELIVERY SYSTEM

**Mark E. July, 2118 Carol, Ann Arbor, Mich. 48103**

**Filed May 29, 1980, Ser. No. 154,508**
**Int. Cl.³ H05B *1/02***
**U.S. Cl. 219—309** **4 Claims**




1. A rapid-response water heating and delivery system for quickly heating water to a selected set point temperature within a predetermined temperature range and for providing a perceivable measure of the temperature of the water issuing therefrom, said delivery system comprising a water vessel having a water inlet and a water outlet positioned such that incoming water flows through said vessel from said inlet to said outlet and means for dispensing water from said outlet onto a person using the system, electrical heating means connected to a source of electrical energy and located in said vessel in a position for heating the water as it flows through said vessel, control means for controlling electrical energy supplied to said electrical heating means such that said water being discharged from said vessel has a temperature value essentially equal to said selected set point temperature, said control means including regulating means comprising a temperature setting device actuatable over a range of temperature to establish said selected set point temperature, said regulating means including temperature indicating means positioned with respect to said water outlet so as to provide the user of said system a perceivable measure of the temperature of the water being discharged from said outlet, a single temperature sensor disposed at the water outlet of the vessel for sensing the temperature of the water being discharged from said vessel, and demand-responsive means operatively associated with said temperature sensor and said regulating means and automatically operable to control said electrical heating means taking into account said selected set point temperature of the temperature setting device in said regulating means, the actual temperature of the water being discharged from said vessel, and the rate at whichd the temperature of the water being discharged from said vessel changes with respect to said set point temperature so that the temperature of the water flowing through said vessel quickly approaches said selected set point temperature, said demand responsive means comprising a proportional integral and derivative controller which automatically cycles said electrical heating means on and off when the temperature of the water being discharged from said vessel is within said predetermined range to offset the heat losses from said vessel including the heat losses resulting from the discharge of heated water, said proportional, integral and derivative controller comprising means connecting said temperature setting device and said temperature sensor in an input circuit of an amplifier stage, means connecting the output of the amplifier stage with both said temperature indicating means and a further portion of said proportional, integral and derivative controller such that the output signal of said amplifier stage controls both the temperature indicating means and said further portion of the proportional, integral and derivative controller, said further portion of the proportional, integral and derivative controller comprising an RC derivative circuit connecting the output of the amplifier stage with the input of a further amplifier stage, said further amplifier stage including a further RC circuit connected between the output and the input of such further amplifier stage for accomplishing the integration function, and means operatively coupling the output of said further amplifier stage with said heating means whereby the heating means is controlled by the proportional, integral and derivative output signal issuing from the output of said further amplifier stage.

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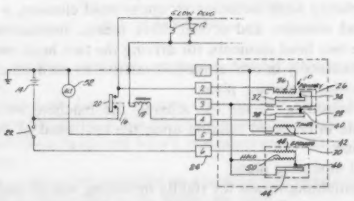
**4,337,389**

## GLOW PLUG CONTROL DEVICE FOR DIESEL ENGINES

**Lon E. Bell, Altadena, Calif., assignor to Technar, Inc., Arcadia, Calif.**

**Continuation of Ser. No. 887,035, Mar. 16, 1978, abandoned.**
**This application May 27, 1980, Ser. No. 153,723**
**Int. Cl.³ H05B *1/02*; F02N *17/00***
**U.S. Cl. 219—511** **7 Claims**

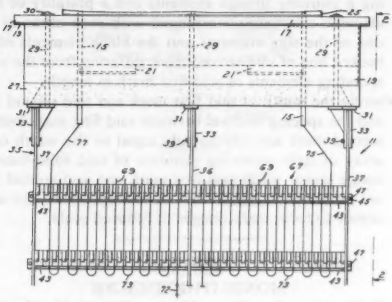


1. A thermal control device for controlling the heating of diesel engine glow plugs or the like, comprising: a base, a first bimetal element supported at one end on the base, first electrical heater means adjacent the surface of the first bimetal element for heating the bimetal element, a second bimetal element supported at one end on the base, second electrical heater means adjacent the surface of the second bimetal element, switch means operated by each of the bimetal elements, the switch means having normally closed contacts connected in series, and means responsive to a current through the series connected normally closed contacts for turning on the glow plugs, whereby either bimetal element when heated interrupts current to the glow plugs, the thermal responsive time of the first bimetal element, first heater means, and switch means being substantially faster than the response time of the second bimetal element, second heater means, and switch means.

## 4,337,390
## ELECTRIC HEATING ELEMENT

**Lorne A. Best, West Bloomfield, Mich., assignor to National Element, Inc., Troy, Mich.**

**Filed Jan. 22, 1981, Ser. No. 227,434**
**Int. Cl.³ H05B *3/06***
**U.S. Cl. 219—532** **12 Claims**



**1.** An improved electrical heating element provided for an increased amount of electrical heating wire per unit space for plug-type convection heaters comprising;

an elongated generally rectangular-shaped metal frame structure open at its ends, having a longitudinal axis and having a pair of laterally spaced-apart support elements defining the longer sides of the rectangle, each support element extending parallel to said axis;

a plurality of spaced removable cross bars made from metal extending through said support elements from one side of the frame structure to the other side thereof in a direction generally perpendicular to said axis;

fastening means carried by said cross bars for removably connecting said cross bars to said support elements;

a plurality of ceramic support blocks, each of T-shape in plan, having spaced end faces and arranged end to end, mounted on and along the length of each cross bar and snugly interposed between said support elements;

a continuous electrical resistance heating wire having a series of parallel spaced inverted U-shaped sections;

each section having a pair of straight wire strands in a first plane;

each block having an undercut central groove extending between said end faces and snugly receiving said cross bars respectively, each support block having a support boss of reduced width adjacent one end face, extending between the strands of each section of the heating wire;

the engaging faces between adjacent blocks defining a clearance recess receiving the pairs of strands of each section of the heating wire;

each section of the heating wire being nested within a pair of said clearance recesses between blocks respectively and supportably mounted upon the respective support boss of each block upon one cross bar;

the one strands between adjacent sections being transversely interconnected below the row of support blocks mounted upon another cross bar.

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## 4,337,391
## MEASURING DEVICE

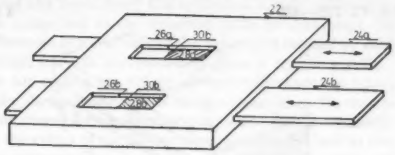
**Shlomo I. Lampert, 10 Yemin Avot Str., Jerusalem, Israel**

**Continuation of Ser. No. 589,403, Jun. 23, 1975, abandoned.**
**This application Dec. 18, 1979, Ser. No. 104,769**
**Claims priority, application Israel, Jul. 26, 1974, 45350**
**Int. Cl.³ G06C *27/00*; G06G *1/02***
**U.S. Cl. 235—70 A** **23 Claims**

**1.** A device for measuring a subject's indication of attitude, opinion, judgment, preference, evaluation, feeling or intention when presented with a question or problem the subjective response to which is sought to be measured, the device comprising:

(a) first means having a defined viewing area;

(b) colored means having at least one colored area, the extent of said colored area viewable in relation to said viewing area being variable in relation to said viewing area to visually express the subjective response of the subject by selecting the extent of said colored area in said viewing area; and



(c) means for translating the extent of said colored area viewed in said viewing area into a scaled value which corresponds to said extent of colored area, said scaled value being operatively arranged so as not to be visible to the subject when viewing said viewing area.

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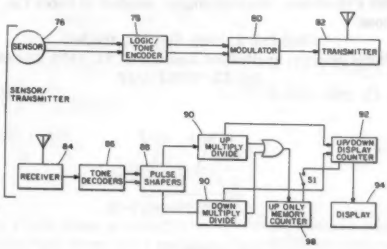
## 4,337,392
## POSITION DETECTOR FOR A POWER RODDING APPARATUS

**Steven W. Baker, Cedar Lake, Ind., assignor to Champion Corporation, Hammond, Ind.**

**Filed Oct. 15, 1979, Ser. No. 85,226**
**Int. Cl.³ G06M *3/14***
**U.S. Cl. 235—92 DN** **15 Claims**




**1.** A circuit for detecting the amount of rod which has been extended into a conduit from a storage reel of a rodding device comprising:

(a) means for detecting the amount and direction of movement of said rod and producing pulse signals representative of said movement,

(b) means for encoding said pulse signals and transmitting them via radio frequency transmission to a remote location,

(c) means for receiving said radio frequency transmission and decoding it to recover said pulse signal information at said remote location,

(d) pulse counting means,

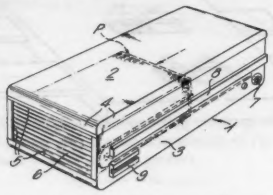
(e) display means for displaying the contents of said pulse counting means,

(f) scaling means receiving the decoded pulse signals and producing said scaled pulse signals to said pulse counting means which correspond to lineal measurement units whereby the displayed contents of said pulse counting means is a direct and instantaneous measure of the length of said rod extended from said reel.

## 4,337,393
## CASSETTE FOR BANKNOTES

**Graham H. Hilton, Lovedean, England, assignor to De La Rue Systems Limited, London, England**

**Filed Dec. 5, 1979, Ser. No. 100,635**
**Claims priority, application United Kingdom, Dec. 8, 1978, 47670/78**
**Int. Cl.³ G05B *1/00*; G06K *5/00*; G06G *7/04***
**U.S. Cl. 235—487** **4 Claims**



1. A cassette, for use with banknote handling apparatus, comprising:
(a) a casing adapted to house a stack of banknotes;
(b) an aperture in said casing to permit transmission of banknotes into and out of the casing; and
(c) machine-readable identification means capable of being pre-programmed to indicate the denomination of the banknotes contained in the cassette, said means comprising a predetermined array of magnets which are adapted to influence at least one magnetic switch associated with said apparatus when said cassette is operatively associated therewith.

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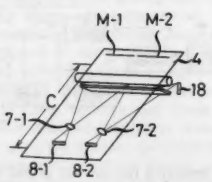
## 4,337,394
## MARK MEANS FOR ADJUSTING THE POSITION OF SOLID-STATE LINE IMAGE SENSOR

**Yoshio Fukushima, Machida, Japan, assignor to Ricoh Co., Ltd., Japan**

**Filed Jul. 8, 1980, Ser. No. 166,960**
**Claims priority, application Japan, Jul. 11, 1979, 54-86837**
**Int. Cl.³ H01J *3/14***
**U.S. Cl. 250—237 G** **8 Claims**




1. In a line-by-line image dissection system comprising a solid-state line image sensor having an array of light receiving elements, an original support plate on which an original is placed, irradiating means for irradiating the original on said original support plate, an optical system including a lens for forming on the surface of said solid-state line image sensor through said lens a fragmentary picture image of a reduced scale of said original corresponding to one line of said original, and auxiliary scanning means for moving said fragmentary picture image of said original in a direction perpendicular to the lengthwise direction of said fragmentary picture image relative to the surface of said solid-state line image sensor, mark means located on said original support plate in a position outside an original support zone in a manner to extend in a direction perpendicular to the auxiliary scanning direction to obtain parallelism of said solid-state line image sensor; such mark means comprising:

a first mark consisting of a solid straight line or a broken straight line including a plurality of sign elements and a plurality of blank elements alternatively arranged with one another, said first mark extending in a main scanning direction perpendicular to the auxiliary scanning direction; and

a second mark consisting of a broken straight line extending parallel to said first mark, said broken straight line including a plurality of sign elements and a plurality of blank elements alternatively arranged with each other, at least one of the sign elements and the blank elements of said broken line of said second mark differing from the corresponding elements of said first mark in length;

wherein the width of said first mark and said second mark and the spacing interval between said first mark and said second mark are substantially equal to the width of the array of light receiving elements of said solid-state line image sensor when said first mark and said second mark are projected on the surface of said solid-state line image sensor to form mark images of reduced scale.

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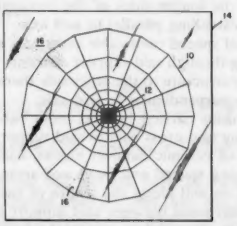
## 4,337,395
## MONOLITHIC IMAGER

**David H. Alexander, Santa Monica; George H. Hershman; Michael D. Jack, both of Carlsbad; N. John Koda, Vista, and Randahl B. Lloyd, San Marcos, all of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.**

**Division of Ser. No. 951,221, Oct. 13, 1978, Pat. No. 4,198,646.**
**This application Nov. 28, 1979, Ser. No. 98,262**
**Int. Cl.³ H01J *31/50*; G01J *1/00***
**U.S. Cl. 250—332** **2 Claims**




1. A two dimensional imager for detecting the presence of radiation and producing a mapping thereof comprising:
(a) a plurality of detectors;
(b) said plurality of detectors being engaged to image output means; and
(c) said plurality of detectors being arranged into a matrix having a square center surrounded by a number of polygonal rings so that a relatively high resolution mapping of detected radiation is achieved at the center of said imager.

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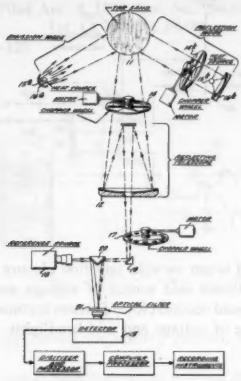
## 4,337,396
## METHOD FOR BITUMEN ANALYSIS AND APPARATUS THEREFOR

**James L. Lauer, Ballston Lake; Vincent W. King, and Keyser K. Lau, both of Troy, all of N.Y., assignors to Suncor Inc., Toronto, Canada**

**Filed Jun. 6, 1980, Ser. No. 156,908**
**Int. Cl.³ G01J *1/00*; G01V *5/00***
**U.S. Cl. 250—340** **17 Claims**

1. A method for the quantitative analysis of hydrocarbons in tar sands, coal, shale or similar materials wherein said material is heated and the thermal radiation from said material is passed through at least two synchronous radiation choppers and through a band pass optical filter characteristic of the spectral radiance of the hydrocarbon in the target material to radiation detector means, a first chopper being close to said material being analyzed and the radiation passing through said first

chopper being focused to pass through a second chopper rotating in phase and at the same angular speed as said first chopper, and radiation from a reference source which is a material essentially the same as the target material or a tunable laser



being directed alternately with the radiation from said material to said detector, the concentration of hydrocarbon in said material being determined by comparison with calibration curves of the detected radiation and percent concentrations.

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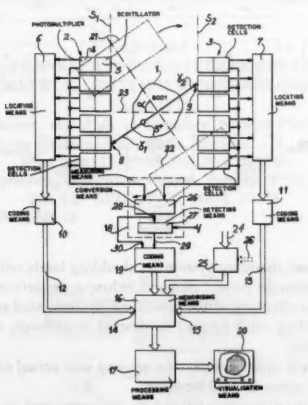
**4,337,397**

## APPARATUS FOR VISUALIZING A BODY BY DETECTING THE RADIATION OF A TRACER CONTAINED IN THIS BODY AND CONSISTING OF POSITRON EMITTERS

**Jacques Vacher, Seyssinet, France, assignor to Commissariat a l'Energie Atomique, Paris, France**

**Filed Jan. 17, 1980, Ser. No. 112,812**
**Claims priority, application France, Jan. 26, 1979, 79 02053**
**Int. Cl.³ G01T *1/20***
**U.S. Cl. 250—363 S** **14 Claims**



1. An apparatus for visualising a body by detecting the radiation of a tracer contained in this body and consisting of positron emitters, comprising:

detection cells situated on each side of the body and permitting detection of the $\gamma$ particles released by each positron emitter in two opposite directions;

means for locating cells arranged in pairs opposite one another, on each side of the body, each pair of opposing cells being located on a straight line passing through a positron emitter;

means for coding the location of said pairs of opposing cells;

means for memorising these coded location signals;

means for processing these coded and memorised signals;

visualisation means, controlled by the processing means, for visualising the image of the body from the different signals coded and memorised; this apparatus further comprising:

means connected to the detection cells for measuring the differences in travel time of the $\gamma$ particles emitted by each emitter, towards corresponding pairs of opposing cells;

means for coding the values of these differences in travel times, these coding means being connected to the memorising means for also memorising coded signals representing the values of the differences in travel times, and so that the processing means receive the additional coded and memorised values representing the differences in travel times, for visualising the image of the body.

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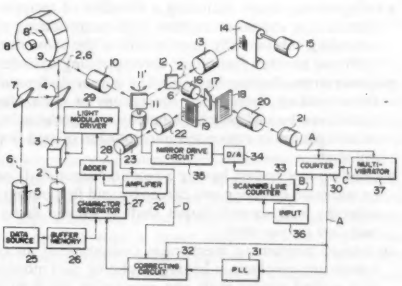
**4,337,398**

## DEVICE FOR CORRECTING DISPLACEMENT OF FORM SLIDE IN A LIGHT BEAM SCANNING TYPE RECORDING SYSTEM

**Masahiro Ohnishi, and Tsutomu Kimura, both of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan**

**Filed Aug. 15, 1980, Ser. No. 178,585**
**Claims priority, application Japan, Aug. 16, 1979, 54-104421**
**Int. Cl.³ G01N *21/86***
**U.S. Cl. 250—548** **2 Claims**



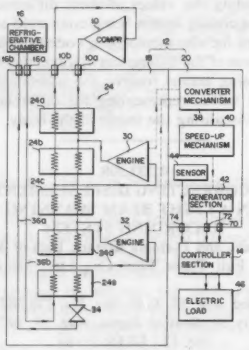
1. In a light beam scanning type recording system in which a read-out light beam and a recording light beam are deflected by means of a two-dimensional light deflecting means, a part of the read-out light beam performs raster scanning of a form slide to generate a form signal, another part of the read-out light beam performs raster scanning of a linear encoder to generate a photoelectric pulse signal, a data signal is read out by use of a video clock signal obtained by multiplying said photoelectric pulse signal by n-times, and a recording light beam is modulated by a video signal obtained by combining said data signal with said form signal to record the combination of the form and the data on a recording material,

a device for correcting displacement of the form slide from a predetermined position with respect to the data information recorded on the recording material comprising an optical mark provided on said form slide, means for generating a mark signal when said read-out light beam passes through said optical mark, means for counting clock pulses from a pulse generator until when a predetermined photoelectric signal is outputed since said mark signal is generated, means for detecting the amount of displacement of said form slide in the direction of scanning based on the counted number of the clock pulses, and means for delaying the video clock signal or the form signal according to the detected amount of displacement.

## 4,337,399
## REFRIGERATOR

**Hiroyuki Nakamura, Yokohama, and Shuniti Nakaya, Kawasaki, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan**

**Filed Dec. 18, 1979, Ser. No. 104,802**
**Claims priority, application Japan, Dec. 22, 1979, 54/174889[U]**
**Int. Cl.[3] B60H *3/04*; H02P *9/04***
**U.S. Cl. 290—1 R** **8 Claims**




1. A refrigerator comprising:

a refrigerating means including a plurality of reciprocating motion type expansion engines with reciprocating pistons extending substantially parallel and in the same direction with one another from their corresponding cylinders;

a converter mechanism having a first output shaft parallel to the extending direction of the pistons or main direction and driven by said pistons, whereby reciprocating motion of said pistons is converted into rotation of said first output shaft;

a speed-up mechanism having a second output shaft parallel to said main direction and driven by said first output shaft, whereby said second output shaft is rotated faster than said first output shaft;

an energy consuming mechanism composed of an energy converting mechanism having a rotating part mounted on said second output shaft and converting mechanical energy supplied from said second output shaft into electrical energy and a load means to consume the electrical energy obtained by way of said energy converting mechanism; and

a control means for automatically adjusting said load means so that the operating speed of said expansion engines may be maintained substantially at a fixed value.

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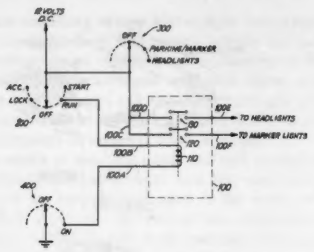
## 4,337,400
## AUTOMATIC HEADLIGHT CONTROL SYSTEM

**Thomas J. Hahn, 17 Spruce Rd., North Caldwell, N.J. 07006**

**Filed Jul. 16, 1980, Ser. No. 169,397**
**Int. Cl.[3] H02G *3/00***
**U.S. Cl. 307—10 LS** **3 Claims**

1. In combination with an automobile electrical system including a source of voltage, an ignition switch, a windshield wiper switch, a pair of headlights, and a set of marker lights, an automatic headlight control system wherein the improvement comprises:

switching means including energization means and first and second closure means responsive to said energization means for connecting said source of voltage to said headlights and said marker lights when said energization means is energized and for disconnecting said source of voltage from said headlights and said marker lights when said energization means is de-energized, wherein said energization means is connected between said ignition switch and said windshield wiper switch and is energized by the concurrent activation of said ignition switch and said




windshield wiper switch, said first closure means is connected between said source of voltage and said marker lights and said second closure means is connected between said source of voltage and said headlights.

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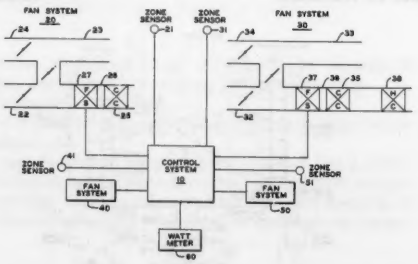
## 4,337,401
## ADAPTIVE LOAD SHEDDING

**Harold J. Olson, Hawthorn Woods, Ill., assignor to Honeywell Inc., Minneapolis, Minn.**

**Filed Jan. 23, 1981, Ser. No. 228,020**
**Int. Cl.[3] H02J *3/00***
**U.S. Cl. 307—39** **6 Claims**




1. A load shedding system for shedding loads within a building to maintain power demand below a predetermined limit, said loads affecting actual conditions in associated zones within said building with respect to desired conditions, said system comprising:

condition sensing means for sensing said actual conditions in said zones of said building;

connecting means adapted to be connected to said loads within said building; and,

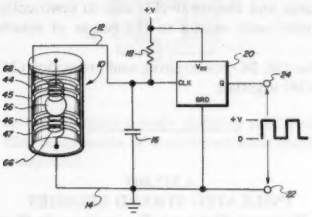
control means connected to said condition sensing means and to said connecting means for shedding said loads in order of those loads affecting those zones having the least deviation between said actual conditions and said desired conditions being shed first and those loads having the most deviation being shed last to maintain said demand below said predetermined limit.

4,337,402

## MOTION SENSOR SWITCH AND CIRCUIT FOR USE THEREWITH

Victor A. Nowakowski, Des Plaines, Ill., assignor to Mattel, Inc., Hawthorne, Calif.

Filed Apr. 9, 1981, Ser. No. 254,021
Int. Cl.[3] H01H 35/14
U.S. Cl. 307—121 16 Claims



1. In a switch device for sensing motion, the combination comprising:

a generally non-conductive sleeve housing member having a plurality of circumferentially extending, spaced, generally parallel contact means on the interior thereof, said contact means being positioned generally intermediate the ends of said housing member;

a switch member configured for being loosely received within said housing member;

means for resiliently suspending said switch member within said housing member in spaced proximate relation to said contact means and longitudinally intermediate the first and last of said contact means, one of said switch member and said suspending means having a peripheral portion configured for engaging said contact means during movement of said switch device and being conductive at least in the area of such engagement; and

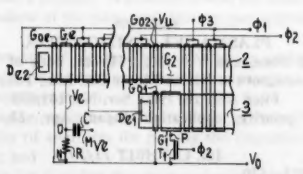
means coupled to said contact means and to one of said switch member and said suspending means for providing first and second electrical output leads for said switch device for connection to other electrical circuitry.

4,337,403

## CHARGE-TRANSFER PHASE-INVERTER DEVICE AND DIFFERENTIAL AMPLIFIER COMPRISING SAID DEVICE

Jean L. Berger, and Jean L. Coutures, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Jun. 12, 1980, Ser. No. 158,863
Claims priority, application France, Jun. 12, 1979, 79 14998
Int. Cl.[3] G11C 19/28; H01L 29/78
U.S. Cl. 307—221 D 8 Claims



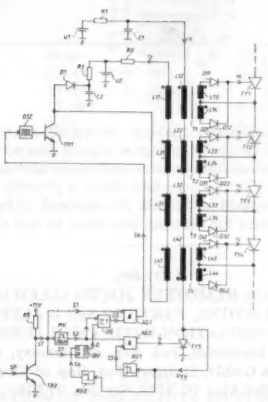
1. A charge-transfer phase-inverter device which receives an input voltage ($V_e$) constituted by the superposition of a direct voltage ($V_O$) and a time-varying sampled voltage ($v_e$), wherein said device comprises means for performing the subtraction between the quantity of charges which is double the quantity corresponding to the direct voltage ($2Q_{moy}$) and the quantity of charges corresponding to each sample of the variable voltage superposed on the direct voltage ($Q_{moy} \pm q_e$).

4,337,404

## APPARATUS FOR FIRING SERIES-CONNECTED THYRISTORS

Bo Kindell, Västerås, Sweden, assignor to ASEA Aktiebolag, Västerås, Sweden

Filed Dec. 20, 1979, Ser. No. 105,479
Claims priority, application Sweden, Dec. 22, 1978, 78132362
Int. Cl.[3] H03K 17/72
U.S. Cl. 307—252 L 9 Claims



1. In an apparatus for simultaneously firing a plurality of series-connected thyristors, wherein a plurality of control pulse transformers are provided having series-connected primary windings which are connected to a voltage source and having secondary windings which are connected to the control electrodes of the thyristors, the apparatus being arranged to provide a steep control current pulse having a short duration and a high amplitude to the thyristors as well as a continuous control current with a lower amplitude, the improvement wherein each control pulse transformer has first and second primary windings, with the first primary windings of the transformers being connected in series with each other and the series combination being connected across a first voltage source through a first switching means and the second primary windings also being connected in series with each other and the series combination being connected across a second voltage source through a second switching means and further including means for activating said first switching means for providing said steep control current pulse through said first primary windings and means for activating said second switching means for providing said continuous control current with lower amplitude through said second primary windings.

4,337,405

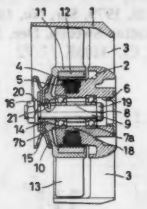
## ELECTRIC GENERATOR

Tadashi Hishida, 2-3, 2,-cho, Kitashimizu-cho, Sakai-shi, Osaka-fu, Japan

Filed Feb. 18, 1981, Ser. No. 235,738
Claims priority, application Japan, Mar. 19, 1980, 55-35986
Int. Cl.[3] H02K 5/16
U.S. Cl. 310—43 1 Claim

1. An electric generator comprising: a stator molded of plastic and provided with an axial center hole; a laminated core embedded in said stator coaxially therewith and having a plurality of pole shoes radially formed on an outer surface thereof; a plurality of coils formed on said pole shoes; two ball bearings disposed in said center hole of said stator, one of said

two ball bearings having an outer ring by which an annular groove is formed in the cylindrical surface of said center hole of said stator coaxially therewith at the time when said stator is molded of plastic such that said outer ring remains in said annular groove after the molding of said stator, the other of said two ball bearings being fitted into one end portion of said



center hole of said stator coaxially therewith; a tubular spacer for holding said two ball bearings at a given distance from each other; a rotary shaft fitting within said spacer and said two ball bearings; a rotor fitting over said stator; a plurality of permanent magnets embedded within the internal surface of said rotor; and a means for securing said rotor to said shaft.

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**4,337,406**

## BEARING-LESS REMOTELY JOURNALLED DYNAMO ELECTRIC MACHINE, PARTICULARLY ALTERNATOR FOR COMBINATION WITH A GAS TURBINE

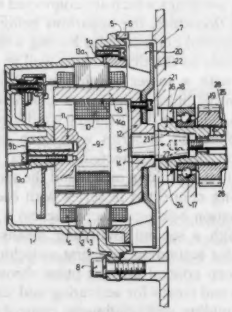
**Georg Binder, Bechhofen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany**

**Filed May 10, 1979, Ser. No. 37,504**

**Claims priority, application Fed. Rep. of Germany, May 27, 1978, 2823256**

**Int. Cl.³ H02K *5/00***

**U.S. Cl. 310—91** **8 Claims**



1. Bearingless, remotely journalled dynamo electric machine for combination with and assembly to a remote rotating apparatus having

a housing (7) and an operating shaft (16) journalled therein and passing through the housing, said machine having a shell (1), cooperating locating means (5, 6) formed on the shell and on the apparatus housing, respectively, to position the shell with respect to the housing and hence the shaft,

the dynamo electric machine further having

a stator structure including an armature (3, 4) mounted in the shell and a fixed field structure, said structures being positioned concentrically with respect to the shaft,

and a rotor (12) within the shell including a rotating pole structure (13)

and wherein the rotor (12) comprises

a single hub portion (14) secured to and supporting the rotor pole structure (13) and forming the sole support for said pole structure, said single hub portion being located at the side of the machine adjacent the rotating apparatus and including a conical projection (24) extending from the hub portion towards the shaft (16) of the apparatus;

a matching conical recess (23) formed in the shaft of the apparatus and receiving said conical projection to rotatably support the rotor by cantilever attachment, to form a driving connection between the shaft (16) of the remote apparatus and the rotor (12) and to centrically position said rotor with respect to the center of rotation of the shaft;

and means (26, 26') for securing said projection (24) and said shaft (16) together.

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**4,337,407**

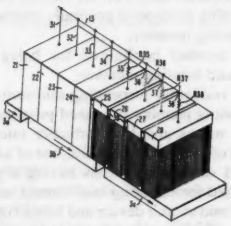
## INSULATED STRAND BRUSHES

**George T. Hummert, Oakmont, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.**

**Filed Apr. 29, 1980, Ser. No. 144,815**

**Int. Cl.³ H01R *39/36***

**U.S. Cl. 310—249** **4 Claims**



1. An electrical conductive brush for a dynamoelectric machine, said brush having a plurality of segments including leading and trailing segments, said trailing segments being insulated from each other and said trailing segments comprising a plurality of individually insulated strands of highly conductive material physically and electrically connected together at one end, said segments each being electrically connected to a lead having resistance disposed therein, said resistance in the lead connected to the leading segment being substantially less than the resistance in the lead connected to the trailing segment, thereby suppressing the energy in an arc formed as the trailing segment breaks contact and preventing melting of the conductive strands.

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**4,337,408**

## PLASMA JET IGNITION PLUG

**Masazumi Sone, and Yukitsugu Hirota, both of Yokohama, Japan, assignors to Nissan Motor Co., Ltd., Tokyo, Japan**

**Filed Apr. 18, 1980, Ser. No. 141,695**

**Claims priority, application Japan, Apr. 23, 1979, 54-55010[U]**

**Int. Cl.³ H01T *13/54***

**U.S. Cl. 313—130** **5 Claims**

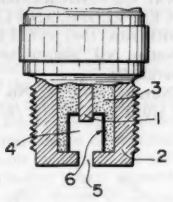
1. A plasma jet ignition plug comprising:

a first electrode;

an insulating body surrounding and supporting said first electrode and forming a plasma cavity surrounding one end of said first electrode;

a second electrode positioned in engagement with a portion of said insulating body and having a portion closing said

plasma cavity, said portion having an orifice therethrough and opening into said plasma cavity; and




a film on said insulating body defining said plasma cavity, said film being made of a semiconductor including a silicon compound.

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4,337,409

## COLOR DISPLAY TUBE WITH CONTROL GRID POSITIONING FEATURE

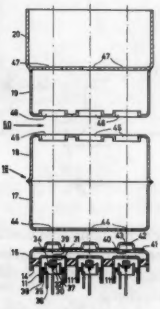
Antonius W. F. van der Heijden; Jörg Brambring, and Johannes M. J. Spruyt, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 28, 1980, Ser. No. 144,793

Claims priority, application Netherlands, May 25, 1979, 7904114

Int. Cl.[3] H01J *29/02*

U.S. Cl. 313—409 4 Claims



1. An electron gun system for a color display tube of the type in which a plurality of electron beams are directed onto a display window of the tube, said electron gun system comprising:

(a) a plurality of electron-beam-producing cathodes, each secured in a control grid having an aperture for passing the respective beam;

(b) an anode, spaced from the control grids and having a plurality of apertures for passing the respective electron beams; and

(c) means for focusing the electron beams onto the display window;

characterized in that the anode is cup-shaped and that a plate of insulating material, having a plurality of respective apertures into which the control grids are inserted, is fixed to the control grids and the anode, thereby securely positioning the control grids relative to each other and to the apertures in the anode.

4,337,410

## CATHODE-RAY TUBE FACE-PLATE

Josephus J. Van der Geer; Willem Van Pelt; Marinus Ploeger; Wilhelmus J. Spoor, and Gerardus H. A. M. Van der Steen, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 2, 1980, Ser. No. 183,480

Claims priority, application Netherlands, Sep. 3, 1979, 7906579

Int. Cl.[3] C03C *3/10;* H01J *31/00*

U.S. Cl. 313—480 6 Claims

1. A fluorine-free glass consisting essentially of the following constituents in the following quantities (expressed in percent by weight):

| | | | |
|---|---|---|---|
| $SiO_2$ | 59–62 | $ZrO_2$ | 1.5–2.5 |
| $Al_2O_3$ | 0.2–2.0 | SrO | 9–12 |
| $Na_2O$ | 5.5–8.0 | PbO | 0 |
| $K_2O$ | 7.5–10.0 | $Sb_2O_3$ | 0–1.0 $As_2O_3$ O |
| MgO | 0–2.0 | $TiO_2$ | 0.1–1.0 |
| CaO | 0–2.0 | $CeO_2$ | 0.05–0.5 |
| BaO | 8–10.0 | | |

wherein wt.% $Na_2O$/(wt.% $Na_2O$+wt.% $K_2O$)=0.42–0.45.

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4,337,411

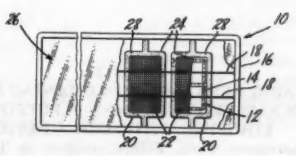
## APPLICATION OF INSULATION TO RIDE FRAME OF VACUUM FLUORESCENT DISPLAY

Robert A. Drummond, Hazleton, Pa., assignor to McGraw-Edison Company, Rolling Meadows, Ill.

Filed Apr. 10, 1980, Ser. No. 138,899

Int. Cl.[3] H01J *1/62, 63/04*

U.S. Cl. 313—497 15 Claims




1. A vacuum fluorescent device comprising:

(a) a substrate;

(b) at least one fluorescent anode carried by said substrate;

(c) a filament in spaced relationship to said anode for supplying electrons to said fluorescent anode;

(d) a grid element disposed between said filament and said fluorescent anode, for control of fluorescence of said anode, said grid element including a control portion and a grid frame, said grid frame supporting said control portion;

(e) a cover sealed to said substrate, enclosing said fluorescent anode, said grid element and said filament;

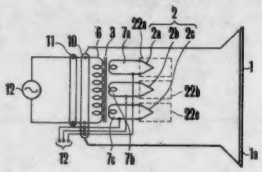
(f) the enclosure formed by said cover and said substrate being evacuated; and

(g) grid control material applied to at least a portion of one of said control portion and grid frame on the side of said grid element nearest said filament, said grid control material being at least partially electrically insulating such that flow of electrons through the grid element increases the brightness of fluorescent light.

## 4,337,412
## CATHODE DEVICE FOR CATHODE-RAY TUBE

Takao Kawamura, Chiba, and Kuniharu Osakabe, Mobara, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 26, 1980, Ser. No. 210,672
Claims priority, application Japan, Nov. 30, 1979, 54-154409
Int. Cl.³ H01J 29/96
U.S. Cl. 315—3 5 Claims



1. In a cathode device for a cathode-ray tube comprising a direct-heating type cathode disposed inside a bulb of the cathode-ray tube and adapted to emit electron beams for causing a fluorescent screen of the cathode-ray tube to luminesce and a transformer provided with a low-voltage secondary coil connected to the direct-heating type cathode and a high-voltage primary coil connected to an external power source whereby the direct-heating type cathode is heated by the external power source through the transformer to generate the electron beam emission, the improvement wherein said transformer is disposed inside said bulb.

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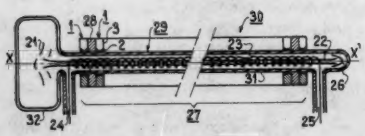
## 4,337,413
## FOCUSING DEVICE WITH PERMANENT MAGNETS FOR ELECTRON TUBE AND ELECTRON TUBE EQUIPPED WITH SUCH A DEVICE

Jean Pontvianne, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Mar. 27, 1980, Ser. No. 134,567
Claims priority, application France, Apr. 3, 1979, 79 08371
Int. Cl.³ H01J 25/34
U.S. Cl. 315—3.5 3 Claims

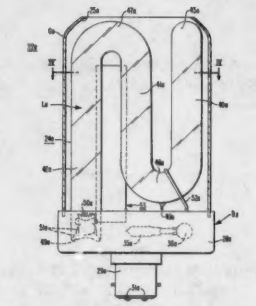


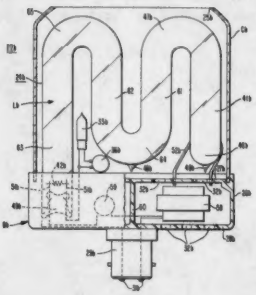
1. A focusing device for an electron tube comprising alternating permanent magnets and pole pieces in the form of flat washers having a central hole and fixed against one another around the envelope of the tube in the electron beam propagation direction, wherein the permanent magnetic washers are open over part of their circumference, the spacing between the edges of the opening being sufficient to permit the passage of the envelope.

## 4,337,414
## COMPACT FLUORESCENT LAMP HAVING CONVOLUTED TUBULAR ENVELOPE OF TRIDIMENSIONAL CONFIGURATION, METHOD OF MAKING SUCH ENVELOPE, AND LIGHTING UNIT INCORPORATING SUCH LAMP

Robert G. Young, Nutley, N.J., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 26, 1979, Ser. No. 97,279
Int. Cl.³ H01J 7/44, 17/34, 19/78, 1/62
U.S. Cl. 315—56 21 Claims





1. In an electric discharge lamp that contains a pair of spaced electrodes and an ionizable medium which sustains an arc discharge between the electrodes when the lamp is energized, the improvement comprising;

a sealed tubular envelope of light-transmitting material having six substantially straight segments that are joined by five curved segments and together therewith form five generally U-shaped sections that merge with one another and define a single discharge channel of convoluted configuration,

four of the conjoined generally U-shaped sections of said envelope being arranged in paired relationship and constituting two generally S-shaped sections that are disposed in different planes and are connected by the fifth generally U-shaped section,

each of the generally U-shaped sections being so oriented that (a) the discharge channel is terminated by two of the substantially straight segments and (b) all of the substantially straight segments extend in the same general direction in columnar array and thus provide a light source that is tridimensional and of compact size.

16. In the manufacture of an electric lamp, the method of forming vitreous tubing that is initially substantially straight into a lamp envelope of convoluted configuration that has five

conjoined U-bent segments, which method comprises the steps of;

heating a predetermined length of such substantially straight vitreous tubing in a manner such that the end portions thereof are rigid and the portions thereof which are to be reshaped are uniformly softened sufficiently to be bent without fracturing or collapsing,

placing a first arcuate mold means against a heat-softened central portion of the tubing,

gripping the rigid end portions of said tubing and swinging them toward one another along a common plane until the heat-softened central portion of the tubing is bent around said first mold means through an arc such that the tubing is U-shaped and the first U-bent segment is formed,

placing a second mold means of arcuate configuration against heat-softened medial parts of each of the leg portions of the U-shaped tubing and, while maintaining the gripped end portions of the tubing stationary, swinging the said first-formed U-bent segment and the first mold means through an arc of approximately 180° along a path which is substantially normal to the plane of the first bending operation and thereby simultaneously bending both of the heat-softened medial parts of said leg portions around the second mold means and forming an additional pair of U-bent segments which are aligned with one another and position the neck of the first-formed U-bent segment proximate the gripped end portions of the tubing,

placing a third arcuate mold means against heat-softened parts of both legs of the tubing at a predetermined location near the gripped end portions of the tubing and, while maintaining the three previously-formed U-bent segments and associated mold means stationary, swinging each of the gripped end portions through an arc of approximately 180° in a direction which is opposite to that in which the second bending operation was performed and along paths which are also substantially normal to the plane of the first bending operation and thereby simultaneously bending the heat-softened parts of said legs around the third mold means and forming two additional U-bent segments in the tubing which are aligned with one another and position the gripped end portions of the tubing adjacent the second-formed pair of U-bent segments, and then

cooling the resulting multi-U-bent tubular envelope to rigidify and set the vitreous tubing in its convoluted configuration and removing said first, second and third mold means.

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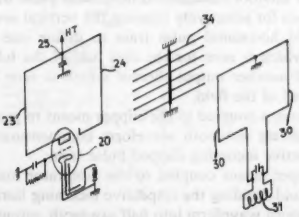
**4,337,415**

## HIGH FREQUENCY INDUCTIVE GENERATOR FOR THE INDUCTIVE COIL OF A PLASMA GENERATOR

**Rene Dürr, Albertville, France, assignor to Instruments S.A., Paris, France**

**Filed Jun. 30, 1980, Ser. No. 164,024**
**Claims priority, application France, Jul. 4, 1979, 79 17359**
**Int. Cl.³ H05H *1/46***
**U.S. Cl. 315—111.51** **3 Claims**




1. High frequency inductive generator for the inductive coil of a plasma generator constituted by a head for inflow of gas to be ionized in an inductive coil, said high frequency inductive generator having an oscillator tube circuit of the quarter wave anode resonant line type and a coupling circuit connected to said inductor coil, wherein said quarter wave anode circuit is controlled from a single oscillator tube, one of the extremities of the circuit from the zero point of the high frequency being connected to the anode of this tube, the other being coupled exteriorly to said anode by capacitive coupling.

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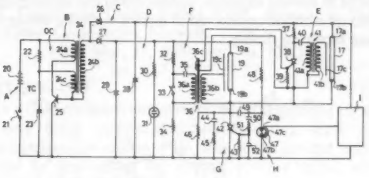
**4,337,416**

## ELECTRIC FLASH APPARATUS

**Yoshiyuki Takematsu, Tokyo, Japan, assignor to Fuji Koeki Corporation, Tokyo, Japan, a part interest**

**Filed Apr. 16, 1980, Ser. No. 140,880**
**Claims priority, application Japan, Apr. 17, 1979, 54-046964; Apr. 17, 1979, 54-046965**
**The portion of the term of this patent subsequent to Dec. 30, 1997, has been disclaimed.**
**Int. Cl.³ H05B *41/32***
**U.S. Cl. 315—241 P** **25 Claims**



1. An electric flash apparatus comprising a first flashing member including at least one first flash tube, a second flashing member including at least one second flash tube, and a flash control arrangement having means for stopping a flash light when a resultant flash light quantity attains a predetermined value, said flash control arrangement includes an electric charge storing circuit for supplying an electrical energy to said first flash tube and said second flash tube, triggering means for triggering said first flash tube and said second flash tube, a flash tube circuit member including the first and the second flash tubes and a switching circuit for actuating said flash tube circuit member, said electric charge storing circuit comprising a first main storage capacitor for supplying an electrical energy to said first flash tube and a second main storage capacitor for supplying an electrical energy to said second flash tube, and said flash tube circuit member comprising a flash timing control means for controlling flash timing such that flash light duration of said first flash tube becomes same or approximately same with flash light duration of said second flash tube.

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**4,337,417**

## STARTING AND OPERATING APPARATUS FOR HIGH-PRESSURE SODIUM LAMPS

**James C. Johnson, Vicksburg, Miss., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.**

**Filed Aug. 14, 1980, Ser. No. 178,046**
**Int. Cl.³ H05B *37/00***
**U.S. Cl. 315—290** **1 Claim**

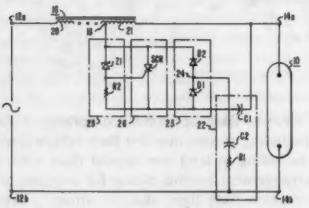
1. A starting and operating apparatus for connection across an AC source for starting and then operating a high-pressure sodium discharge lamp, said apparatus comprising:

(a) input terminals operable to be connected across said AC source, output terminals operable to have said discharge lamp connected thereacross, a ballast inductor having a tap intermediate the ends thereof to define first and second winding portions, said first winding portion having a greater length than said second winding portion and having a transformation ratio therebetween substantially greater than unity, said ballast inductor connected at its ends in series between one of said input terminals and one of said output terminals with said second winding portion connected to said one output terminal, and the other of

said input terminals electrically connected to the other of said output terminals;

(b) capacitive energy storage means and blocking diode means therefor connected in circuit between said output terminals and in circuit with said tap, said capacitive energy storage means comprising two individual capacitors, and said blocking diode means comprising two blocking diodes, one of said capacitors connected in circuit between said one output terminal and the anode of one of said blocking diodes, the cathode of said one diode connected in circuit to a common electrical point, the other of said capacitors connected in circuit between said common electrical point and said other output terminal, a charging resistor connected in series circuit with said other capacitor between said common electrical point and said other output terminal, the other of said blocking diodes having its anode connected in circuit with said common electrical point and its cathode connected in circuit with said tap;

(c) gate-controlled solid-state switching means comprising an SCR having its anode connected in circuit with said tap and its cathode connected in circuit with the anode of said one blocking diode;



(d) Zener diode means comprising a Zener diode having its cathode connected in circuit with said tap and its anode connected in circuit with the gate of said SCR, said Zener diode having a predetermined Zener voltage which is less than twice the peak voltage of said source, said Zener diode means further comprising a bleeder resistor connected in circuit between the gate and the cathode of said SCR, whereby when said apparatus is initially energized, said other capacitor charges toward the peak voltage of said AC source during the negative half cycle and when the voltage of said source goes positive, the voltage on said other capacitor is added to the voltage of said source to charge said one capacitor toward twice the peak of said source, upon the voltage of said one capacitor exceeding said predetermined Zener voltage of said Zener diode, said SCR is gated thereby causing said one capacitor to discharge through said second winding portion to cause the autotransformer action thereof to apply a voltage pulse of sufficient magnitude across said output terminals to start said lamp connected thereacross, and after said lamp is started, the Zener voltage of said Zener diode is not exceeded, thereby rendering the lamp starting portion of said apparatus inoperative.

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**4,337,418**

## STARTER UNIT FOR GAS DISCHARGE LAMPS POWERED BY ALTERNATING-CURRENT MAINS

**Alfred Walz, Am Kurzarm 7, 7830 Emmendingen, Fed. Rep. of Germany**

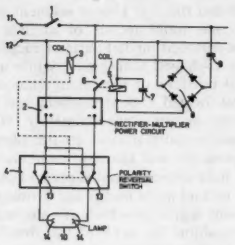
**Filed Mar. 25, 1980, Ser. No. 133,939**

**Claims priority, application Fed. Rep. of Germany, Apr. 4, 1979, 2913525**

**Int. Cl.**[3] **H05B** *37/02, 39/06, 41/04, 41/18*

**U.S. Cl. 315—362** **8 Claims**

1. A circuit for starting and powering a gas discharge lamp, such as a fluorescent lamp, from alternating current mains using direct current power to the lamp, the combination of rectifying means, a normally open relay contact in said circuit between said rectifier means and said alternating current mains, said normally open relay contact controlling the power input to said lamp means, a polarity-reversing switch means in said circuit connected in parallel between the output of said alternating current mains and said lamp, means responsive to energization of the alternating current mains for effecting reversal of said polarity-reversing switch means upon energization of said mains, time delay relay means controlling said normally open relay contact and responsive to each energization of the mains for closing said relay contact subsequent to



each operation of said polarity-reversing switching means, and said time delay relay means including a coil and a capacitor in parallel circuit to each other, said time delay relay means being wired in said circuit in a branch separate from said polarity-reversing means; whereby each reversal of said polarity-reversing switch takes place under a no-load condition immediately upon energization of said circuit, and whereby said polarity-reversing switch means is connected to said alternating current mains only after both said polarity-reversing action has taken place and after said time delay of said time delay relay means has timed out.

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**4,337,419**

## ANALOG GEOMETRY CORRECTOR FOR TELEVISION CAMERA IMAGE TUBES

**James R. Holzgrafe, Sunnyvale, Calif., assignor to Ampex Corporation, Redwood City, Calif.**

**Filed Apr. 1, 1980, Ser. No. 136,230**

**Int. Cl.**[3] **H01J** *29/70*

**U.S. Cl. 315—371** **10 Claims**

1. A corrector circuit for generating selected correction waveforms for addition to the basic scan deflection waveforms of a television camera tube to correct given geometric scan errors in given portions of the picture raster, comprising the combination of;

means for amplitude modulating a train of horizontal-rate pulses with a vertical-rate sawtooth waveform to provide a vertical sawtooth-modulated horizontal pulse train;

clipper means for selectively clipping the vertical sawtooth-modulated horizontal pulse train to define one output thereof which is zero for the first half of the television field, and another output thereof which is zero for the second half of the field;

integrator means coupled to the clipper means to generate a horizontal-rate sawtooth waveform commensurate with the respective incoming clipped pulse train;

second clipper means coupled to the integrator means for clipping and dividing the respective incoming horizontal-rate sawtooth waveform into half-sawtooth output waveforms; and

means coupled to the second clipper means for selecting proportions of the half-sawtooth output waveforms commensurate with the geometric scan errors and the corresponding required to provide selected error correction waveforms in the given portions of the picture scan raster.

4,337,420

## DUAL MODE COLOR SWITCH FOR BEAM PENETRATION CRT

Michael H. Kalmanash, Fairfield, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed May 1, 1981, Ser. No. 259,343
Int. Cl.[3] H01J 29/80
U.S. Cl. 315—375 7 Claims

1. A high voltage color switch for a beam penetration cathode-ray tube having a first mode in which color write periods of different colors are formed in a sequential manner, and a second mode in which a baseline color is normally displayed but color write periods in random colors can be formed, comprising:

high voltage power supply means having a reference input and a high voltage output level selected to provide a predetermined baseline color when presented to said cathode-ray tube;

Transformer means connected between the output of said high voltage power supply means and said beam penetration cathode-ray tube;

driver means for receiving an input waveform at an input and amplifying the same presentation to said transformer for providing the needed swing to generate a particular color in a color write period;

First switch means having an open position and a closed position, and connected between the output of said driver means and said transformer means;

integration means connected between said input of said driver means and the reference terminal of said high voltage power supply;

second switch means connected to said integration means for disabling it in the second mode; and

whereby in said first mode for displaying color write periods of different colors in a sequential manner said second switch means is open so that the DC level associated with the input waveform is presented to said reference input of said high voltage power supply to correspondingly adjust its high voltage output level at the same time said first switch means is closed so that said input voltage waveform is presented to said driver means, but in said second mode said second switch is closed, disabling said integration means so that a color write period in a random color can be generated.

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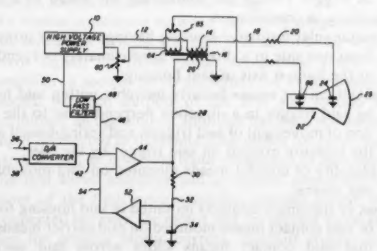
4,337,421

## SEQUENTIAL COLOR SWITCH FOR BEAM PENETRATION CRT

Michael H. Kalmanash, Fairfield, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed May 1, 1981, Ser. No. 259,344
Int. Cl.[3] H01J 29/80
U.S. Cl. 315—375 9 Claims




1. A high voltage color switch for a beam penetration cathode-ray tube in which a preselected voltage level is related to a particular color to be displayed on said cathode-ray tube, comprising:

high voltage power supply means connectable to said cathode-ray tube and having an output voltage level selected to provide a first predetermined color on said cathode-ray tube;

a transformer means connectable between the output of said high voltage power supply means and said beam penetration cathode-ray tube;

driver means connected to said transformer for amplifying an input waveform received at an input terminal;

feedback means coupled to said driver means to sense the DC level in said input waveform and to feed said DC level back to said input terminal of said driver means; and

integration means connected to a reference terminal of said high voltage power supply to integrate said input waveform into a DC level and to provide a signal proportional thereto to said high voltage power supply for changing its output by an amount proportional to the DC level of said input waveform.

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4,337,422

## FIELD EMISSION GUN WITH NOISE COMPENSATION

Lee H. Veneklasen, Castro Valley, Calif., assignor to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Mar. 17, 1980, Ser. No. 131,205
Int. Cl.[3] H01J 29/52
U.S. Cl. 315—383 7 Claims

1. In a field emission gun system, beam regulating means for measuring beam current and for regulating beam current emerging from an emission tip at a local ground reference potential by controlling the control voltage on an adjacent control electrode, said field emission gun system having a sample electrode at earth ground potential and an accelerating potential power source having a first terminal coupled to said sample electrode at earth ground potential and a second terminal coupled to said local ground reference potential, said beam regulating means comprising;

current measuring circuitry coupled to said power source and to said emission tip for measuring current through said power source substantially at said local ground reference potential of said emission tip, said current measuring circuitry providing an output voltage proportional to said measured current;

a central electrode adjacent said emission tip, and

comparison circuitry responsive to said measuring circuitry output voltage and to a predetermined beam current reference voltage for generating an error output voltage signal to said adjacent control electrode.

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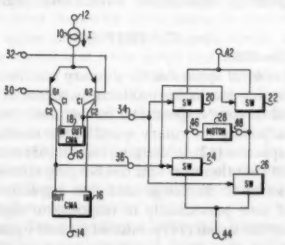
4,337,423

## DUAL OUTPUT SWITCHING CIRCUIT

Raymond L. Giordano, Flemington, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Jul. 24, 1980, Ser. No. 171,833
Int. Cl.[3] H02P 1/22
U.S. Cl. 318—280 10 Claims




5. A motor direction control circuit comprising:

first and second current conduction means each for selectively conducting respective first and second currents;

control means for selectively enabling one of said first and second current conduction means to conduct its respective first and second currents in response to an input signal;

first current transfer means having input and output terminals one of which is connected for receiving said first current of said first current conduction means and the other of which is connected for receiving the first current of said second current conduction means;

second current transfer means having input and output terminals, one of which is connected for receiving the second of said second current conduction means and the other of which is connected for receiving the second current of said first current conduction means;

first, second, third and fourth switches each having first and second electrodes, and a control electrode for selectively controlling the conductivity between its first and second electrodes, the control electrodes of said first and third switches being connected to said output terminal of said first current transfer means, the control electrodes of said second and fourth switches being connected to said output terminal of said second current transfer means, said first switch being connected to selectively conduct current between a first circuit node and a first power supply terminal, said second switch being connected to selectively conduct current between said first circuit node and a second power supply terminal, said third switch being connected to selectively conduct current between a second circuit node and said second power supply terminal, said fourth switch being connected to selectively conduct current between said second circuit node and said first power supply terminal; and

a motor having first and second terminals connected to said first and second circuit nodes respectively, said motor providing mechanical motion in one direction in response to current flow from said first terminal to said second terminal and providing mechanical motion in another direction in response to current flow from said second terminal to said first terminal;

wherein said first and second current transfer means provide respective first and second current transfer ratios between their respective input and output terminals and said first and second current transfer ratios are selected to define the order in which said first and third switches, and said second and fourth switches, selectively conduct current between their respective first and second terminals.

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**4,337,424**

## SPEED CONTROL FOR A ROTARY MACHINE

**Heinrich Cap, St. Georgen; Johann von der Heide, Monchweiler, and Rolf Müller, St. Georgen, all of Fed. Rep. of Germany, assignors to Papst-Motoren KG, St. Georgen, Fed. Rep. of Germany**

**Filed Oct. 10, 1980, Ser. No. 195,862**

**Claims priority, application Switzerland, Apr. 16, 1980, 2931/80**

**Int. Cl.³ H02P** *5/16*

**U.S. Cl. 318—328** **10 Claims**

1. Speed control apparatus for a rotary machine comprising signal generating means for producing a signal of a frequency proportional to rotary speed and having also torque varying means for adjusting the rotary speed of the machine:

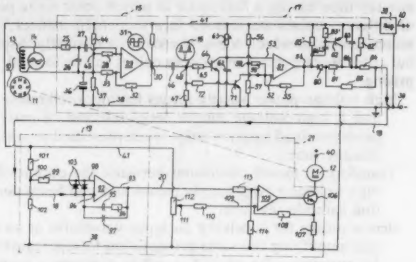
(a) a first capacitor (**62**), a charging circuit (**63**) and a discharging circuit (**64**) therefor, said discharging circuit being constituted so as to discharge said first capacitor in a short period of time periodically in response to signals (**16**) derived from the signal (**14**) produced by said signal generating means;

(b) a threshold circuit (**51**) to which said first capacitor is connected for providing an output signal when the voltage across said first capacitor exceeds a predetermined value;

(c) a second capacitor (**83,123**) connected so that its charge condition is controlled by said output signal of said threshold circuit;

(d) means (**19,20**) responsive to the voltage across said second capacitor for actuating said torque varying means of said rotary machine;

(e) active normalizing circuit means (**82;127**) connected to said second capacitor; and



(f) means (**71; 120; 153–155**) for activating said active normalizing circuit means before each new changes of the charge condition of said second capacitor produced by said threshold circuit output signal and thereby bringing the charge condition of said second capacitor substantially to a predetermined charge value before the beginning of each new charging of said second capacitor by said threshold circuit output signal.

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**4,337,425**

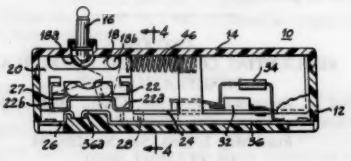
## SPEED CONTROL TRIGGER SWITCH

**Jackson H. Smith, Union Grove, Ala., assignor to Eaton Corporation, Cleveland, Ohio**

**Filed Jun. 2, 1980, Ser. No. 155,692**

**Int. Cl.³ H02P** *7/24;* **H01H** *1/22*

**U.S. Cl. 318—345 G** **5 Claims**



1. A trigger switch for controlling the speed of a motor, comprising in combination:

a rectangular insulative housing having a trigger protruding from one side in a direction approximately perpendicular to the longest axis of said housing;

contact carrier means linearly movable within said housing by said trigger in a direction perpendicular to the direction of movement of said trigger, and spring-biased against the pressure exerted on said trigger by the user;

a plurality of contact means mounted on said movable carrier means;

a set of stationary contacts mounted in said housing for each of said contact means mounted on said carrier means, such that said contact means slides across said stationary contacts, closing a circuit as said carrier means moves due to pressure on said trigger by the user;

terminal means for connecting said sets of stationary contacts to a source of electric power and to the motor; and

a speed control circuit in connection with one of said sets of stationary contacts to provide a trigger speed control

circuit capable of variable motor speed control by trigger depression;

said set of stationary contacts which is in connection with said speed control circuit comprising three contacts linearly spaced in the direction of movement of said contact carrier means, said speed control circuit being in connection with the outside two of said three contacts, said outside two contacts being bridged by a respective one of said contact means upon initial movement of said contact carrier means in response to trigger depression, the third contact of said three contacts being located between said outside two contacts and being in direct connection with the motor, said third contact and one of said outside two contacts being bridged by said respective one of said contact means when said contact carrier means is at the limit of movement in response to trigger depression to connect the motor directly to said source of electric power in shunt of said speed control circuit to apply full power directly to the motor being controlled, resulting in maximum speed of the motor.

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**4,337,426**

## STABILIZED SERVO MOTOR POSITIONING APPARATUS

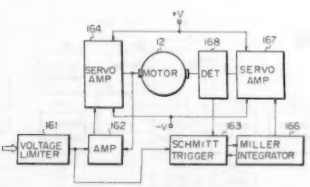
**Tomoatsu Imamura, Tokyo, Japan, assignor to Ricoh Co., Ltd., Tokyo, Japan**

**Filed Aug. 28, 1980, Ser. No. 182,174**

**Claims priority, application Japan, Aug. 31, 1979, 54/111280; Oct. 13, 1979, 54/132183; Oct. 13, 1979, 54/132184**

**Int. Cl.[3] G05B *11/28***

**U.S. Cl. 318—599** **6 Claims**




**1**. A servo positioning apparatus including a servo motor having a rotary shaft, transducer means for producing periodic signals in response to rotation of the shaft and computing means responsive to the periodic signals for computing a difference between a command motor shaft speed and an actual motor shaft speed and generating an error signal corresponding thereto, characterized by comprising:

drive means connected between the computing means and the motor for driving the motor in accordance with the error signal, the drive means comprising a first servo amplifier, a second servo amplifier, the motor being connected between outputs of the first and second servo amplifiers, an operational amplifier having a non-inverting input connected to the computing means for receiving the error signal, an inverting input connected to the output of the first servo amplifier and an output connected to an input of the first servo amplifier, current sensor means connected between the motor and the second servo amplifier for sensing motor current, Schmitt trigger means having a non-inverting input connected to an output of the current sensor and Miller integrator means having an input connected to an output of the Schmitt trigger means and an output connected to an inverting input of the Schmitt trigger means and to an input of the second servo amplifier, the Miller integrator means generating a sawtooth signal.

**4,337,427**

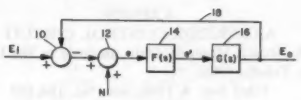
## SELECTIVE FILTER FOR CLOSED LOOP SERVO SYSTEM

**Inge Maudal, Claremont, Calif., assignor to General Dynamics, Pomona Division, Pomona, Calif.**

**Continuation-in-part of Ser. No. 140,037, Apr. 14, 1980, abandoned. This application Dec. 22, 1980, Ser. No. 218,877**

**Int. Cl.[3] G05B *5/01***

**U.S. Cl. 318—615** **7 Claims**




**1**. In a closed loop servo system having an inaccessible input signal $E_i$, an accessible output signal $E_o$, an accessible error signal e, control apparatus having an input and an output, the input of said control apparatus being coupled to said error signal e and the output of said control apparatus being said output signal $E_o$, and a first filter having the characteristics g(s) coupled in series with the input to said control apparatus, the improvement comprising:

a second filter having the characteristics h(s) which satisfied the equation: $g(s)+h(s)=1$, the input of said second filter being coupled to a chosen component of said error signal e; and

means for summing the output of said second filter to the output of said first filter.

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**4,337,428**

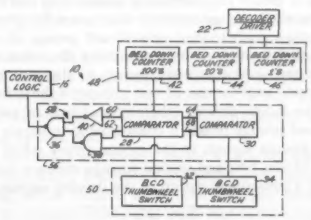
## DECELERATION INITIATION CIRCUIT FOR A STEPPER MOTOR

**Norman E. Oltendorf, Algonquin, Ill., assignor to Bodine Electric Company, Chicago, Ill.**

**Filed Sep. 8, 1980, Ser. No. 185,021**

**Int. Cl.[3] G05B *19/40***

**U.S. Cl. 318—696** **10 Claims**




**1**. In a stepper motor of the type including a stator and having associated therewith drive means for providing a variably timed series of drive pulses to said stator, said stepper motor being operable at a low speed and an accelerated speed in response to said variably timed series of drive pulses, an improved circuit for selectably initiating deceleration of said stepper motor after operation thereof at said accelerated speed, comprising, in combination:

monitor means, coupled to said drive means, for monitoring said drive pulses during operation of said stepper motor and providing a monitor signal representing each of said drive pulses, respectively;

input means for providing a selectable deceleration signal representing a predetermined drive pulse within said variably timed series, said predetermined drive pulse corresponding to a predetermined time during operation of said stepper motor when deceleration thereof is to be initiated; and

comparator means, coupled to said monitor means and said input means, for receiving and comparing said monitor signal and said selectable deceleration signal and for responsively providing a deceleration initiating signal to said drive means whenever a predetermined relationship exists between said monitor signal and said selectable deceleration signal, said drive means initiating deceleration of said stepper motor in response to said deceleration initiating signal.

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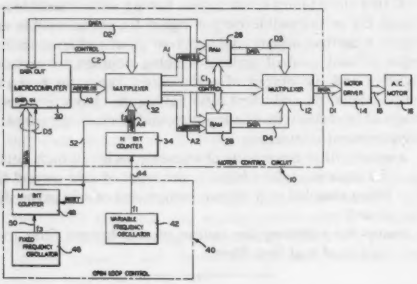
**4,337,429**

## A.C. MOTOR CONTROL CIRCUIT

**Thomas A. Stuart, Maumee, Ohio, assignor to The University of Toledo, Toledo, Ohio**

**Filed Sep. 4, 1980, Ser. No. 184,107**
**Int. Cl.[3] H02P 5/34**
**U.S. Cl. 318—811** **20 Claims**



1. A control circuit for generating a plurality of driving signals to an electric motor driver to control the application of electric power to an A.C. electric motor, comprising:

means for generating successive groups of the driving signals:

a first storage means for said groups of the driving signals;

a second storage means for said groups of the driving signals; and

a control means for alternately connecting one of said first and second storage means to said means for generating the driving signals to load one of said groups of the driving signals into storage and connecting the other one of said first and second storage means to the motor driver to generate another one of said groups of the driving signals to the motor driver, whereby said one of said first and second storage means is connected to generate a group of the driving signals to the motor driver while said other one of said first and second storage means is being loaded with a subsequent group of the driving signals.

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**4,337,430**

## INDUCTIVE-LOAD POWER CONTROL CIRCUIT

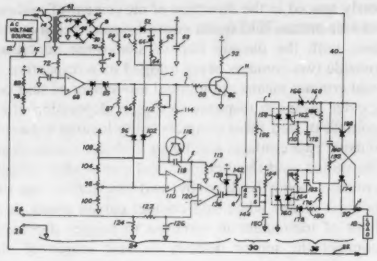
**Steven E. Flego, Portland, Oreg., assignor to Electronics Diversified, Inc., Portland, Oreg.**

**Filed Jan. 26, 1981, Ser. No. 228,324**
**Int. Cl.[3] G05F 5/00**
**U.S. Cl. 323—323** **3 Claims**

1. In a circuit employing conduction-angle control for delivering variable power to different AC inductive loads, which loads create different respective lag angles between applied voltage and delivered current up to a known maximum lag angle

switching means connectible to such a load including a switching device which is trigger-pulse-switched into conduction, and thereafter maintained in conduction so long as current through the device exceeds a certain minimum value, and

trigger-pulse generating means operatively connected to said device for switching the same, said generating means having one mode of operation at conduction angles less than a predetermined maximum width which is no less than said maximum lag angle wherein it generates infinitely width-variable triggering pulses up to said maximum width, and another mode of operation at conduction angles greater than said maximum width wherein it generates substantially fixed-width triggering pulses each having a width substantially equaling said maximum width.



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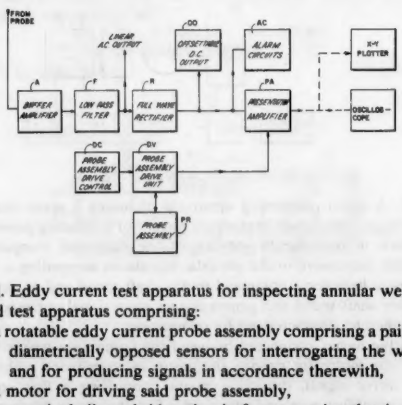
**4,337,431**

## EDDY CURRENT TEST APPARATUS FOR ANNULAR WELDS

**John C. Hale, Thurso, Scotland, assignor to United Kingdom Atomic Energy Authority, London, England**

**Filed Mar. 12, 1979, Ser. No. 19,595**
**Claims priority, application United Kingdom, Mar. 13, 1978, 9849/78**
**Int. Cl.[3] G01N 27/72, 27/82**
**U.S. Cl. 324—220** **3 Claims**



1. Eddy current test apparatus for inspecting annular welds, said test apparatus comprising:

a rotatable eddy current probe assembly comprising a pair of diametrically opposed sensors for interrogating the weld and for producing signals in accordance therewith,

a motor for driving said probe assembly,

means, including a bridge circuit, for comparing the signals produced by said sensors and for providing an out-of-balance signal based on a comparison of said signals,

a sine/cosine potentiometer, driven by said motor so that said potentiometer moves in phase with the probe assembly, for producing electrical output signals in accordance with the position of said probe assembly, said output signals comprising a sine signal and a cosine signal,

a display means, including an x-input and a y-input, for producing a positional indication of the angular location of the potentiometer and thus of said probe assembly responsive to said electrical output signals from said sine/-cosine potentiometer,

first amplifier to which said sine signal is fed and including an output connected to the x-output or y-output of said display means,

a second amplifier to which said cosine signal is fed and including an output connected to the y-input or x-input of said display means,

electronic circuit means for combining directly and in real time the out-of-balance signal with the sine signal by feeding the out-of-balance signal to an input of said first amplifier and for combining directly and in real time the out-of-balance signal with the cosine signal by feeding the out-of-balance signal to an input of said second amplifier, the magnitude of the outputs of the first and second amplifiers being controlled by the combination of signals fed thereto,

and means for correcting any differences in the gain characteristics of said first and second amplifiers,

said display means including means for combining the input signals at said x-input and said y-input to produce a combined display signal in real time in which the angular position of the display is determined solely by the signals from the sine/cosine potentiometer and in which the radial amplitude of the display signal is determined solely by said out-of-balance signal.

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**4,337,432**

## TESTING DEVICE FOR STRUCTURAL PARTS AND FUNCTIONS OF MOTOR VEHICLES

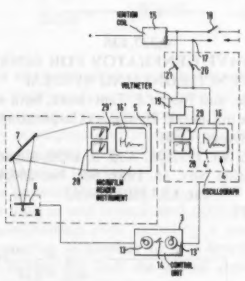
**Peter Flohr, and Franz Gumpinger, both of Munich, Fed. Rep. of Germany, assignors to Bayerische Motoren Werke Aktiengesellschaft, Munich, Fed. Rep. of Germany**

**Filed Sep. 6, 1978, Ser. No. 939,959**

**Claims priority, application Fed. Rep. of Germany, Sep. 12, 1977, 2741035**

**Int. Cl.³ F02P *17/00*; G01R *13/42***

**U.S. Cl. 324—379** **8 Claims**




1. In a testing device for testing structural parts and functions of motor vehicles according to a test program having successive program stages, said testing device comprising a manually operable program switch means for establishing circuit connections associated with the stages of the test program and for controlling a first indicator means for reproduction of the corresponding measurements, the improvement comprising said manually operable program switch means further controlling a second indicator means for reproduction of stored, rated measurements associated with the respective, successive program stages, said second indicator means reproducing the rated measurements in spaced relation, as opposed to superimposed relation, to the reproduction of the actual measurements by the first indicator means whereby said actual and rated measurements can be readily compared, and wherein means are provided for manually adjusting said second indicator means independently of the test program so that when a defect appears stored characteristic data for the defect may be reproduced on the second indicator means whereby the defect can be verified immediately.

**4,337,433**

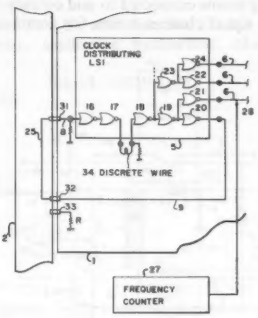
## CLOCK SIGNAL DISTRIBUTING CIRCUIT ADJUSTING DEVICE AND METHOD

**Tatsuro Yoshimura, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan**

**Filed Dec. 17, 1979, Ser. No. 103,928**

**Int. Cl.³ H03K *5/159, 17/00***

**U.S. Cl. 328—55** **18 Claims**




1. A method for adjusting to a desired value the delay time for transmitting a pulse from an input terminal of a clock signal distributing circuit to at least a selected one of plural output terminals thereof the relative difference, between the respective delay times corresponding to each said output terminal being preknown, for distributing with known distribution times a clock signal from a clock signal source that is applied to said input terminal to a plurality of load circuits from respective ones of said output terminals, said selected output terminal having an output corresponding to said pulse that is opposite in phase from the pulse as applied to said input terminal, said clock signal distributing circuit having a rise time that is known in relation to the fall time for transmission of the respective rising and falling edges of each said clock signal being transmitted from said input terminal to said selected output terminal thereof, said method comprising

providing the clock signal distributing circuit with delay adjustment means for varying said delay time between said input terminal and each said output terminal,

short circuiting said input terminal and said selected output terminal of the distributing circuit by a line having a predetermined delay time to cause oscillation of said distributing circuit, and

adjusting said delay adjustment means so that the frequency of said oscillation becomes a predetermined value corresponding to the desired delay time for said distributing circuit to transmit said pulse from said input terminal to said selected output terminal.

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**4,337,434**

## COMPENSATOR FOR SLOWLY RESPONDING SENSORS

**John D. Fogel, Schwenksville, and Will McAdam, Worcester, both of Pa., assignors to Leeds & Northrup Company, North Wales, Pa.**

**Filed May 2, 1980, Ser. No. 146,941**

**Int. Cl.³ H03K *17/74, 5/22***

**U.S. Cl. 328—114** **5 Claims**

1. A signal compensating circuit to provide a compensated output signal having a rapid response from an input signal from a sensing element with a slowly responding output, said sensing element having different response times for changes of the sensed quantity in opposite directions comprising:

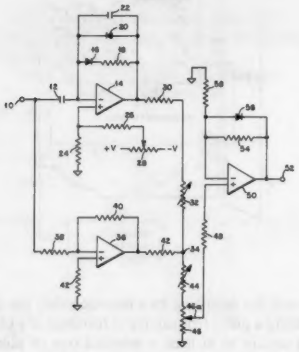
input means for connection to said sensing element,

first signal channel means having an input connected to said input means and an output for producing an output signal

at its output varying in magnitude proportionally in accordance with the magnitude of the rate of change of the signal applied to its input;

second signal channel means having an input connected to said input means and an output for producing an output signal at its output which varies in magnitude proportionally in accordance with the magnitude of the signal applied to its input,

combining means connected to said outputs of said first and second signal channel means for combining said output



signals from said signal channel means to produce said compensated output signal, and

direction sensitive means in said first signal channel means for providing a first proportion between the magnitude of its output signal and the magnitude of the rate of change of said signal applied to said input of said first signal channel means when said signal is changing in one direction and to provide a second proportion between the magnitude of its output signal and the magnitude of the rate of change of said signal applied to said input of said first signal channel means when said signal is changing in the other direction.

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**4,337,435**

**DIGITAL PHASE SEQUENCE DETECTOR**

**Joseph P. Munoz, Miami, Fla., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.**

**Filed Jun. 10, 1980, Ser. No. 158,105**

**Int. Cl.³ H03K 5/26**

**U.S. Cl. 328—133** **4 Claims**

1. A digital phase sequence detector, constructed of standard logic gates devoid of memory elements, which detects phase sequence between first and second phasors, providing a change in its output as the first and second phasors exchange lead and lag positions, which change persists as long as the new relationship persists, comprising:

means providing a first phasor,

means squaring the waveform of aid first phasor to provide a signal $V_P$, and its complement $\overline{V}_P$,

means providing a second phasor,

means squaring the waveform of said second phasor to provide a signal $V_O$, and its complement $\overline{V}_O$,

first logic means providing a first feedback signal $Y_1$, and its complement $\overline{Y}_1$,

second logic means providing a second feedback $Y_2$, and its complement $\overline{Y}_2$,

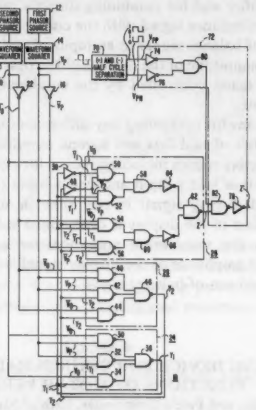
said first logic means being responsive to signals $V_O$, $V_P$ and $Y_1$ such that the first feedback signal $Y_1$ is equal to

$$\overline{(V_O V_P)(V_P Y_1)(V_O Y_1)},$$

said second logic means being responsive to signals $\overline{V}_O$, $V_P$ and $Y_2$ such that the second feedback signal $Y_2$ is equal to

$$\overline{(\overline{V}_O V_P)(V_P Y_2)(\overline{V}_O Y_2)},$$

and third logic means providing an output signal having a first logic level when signal $V_O$ leads signal $V_P$ and a second logic level when signal $V_O$ lags signal $V_P$,



said third logic means being responsive to signals $V_O$, $\overline{V}_O$, $V_P$, $\overline{V}_P$, $Y_1$, $\overline{Y}_1$, $Y_2$ and $\overline{Y}_2$, such that its output signal is equal to

$$\overline{(V_O\overline{Y}_1\overline{Y}_2)(V_P\overline{Y}_2Y_1)(\overline{V}_OY_1Y_2)(\overline{V}_P\overline{Y}_1Y_2)}.$$

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**4,337,436**

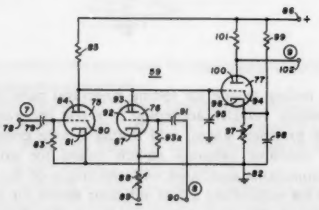
**BLANKING WAVE GENERATOR FOR BINARY CODE SYNCHRONIZING SYSTEM**

**Beryl L. McArdle, and Pierre J. Tapernoux, both of Rochester, N.Y., assignors to General Dynamics Corporation, Electronics Division, San Diego, Calif.**

**Division of Ser. No. 177,528, Aug. 3, 1950, abandoned. This application Nov. 15, 1951, Ser. No. 256,444**

**Int. Cl.³ H03B 9/13**

**U.S. Cl. 328—157** **3 Claims**



1. A blanking wave generator comprising the combination of first and second sources of pulses operating in synchronism, said second pulse source having a lower pulse repetition frequency than said first pulse source, a first electron discharge device having a control electrode connected to said first pulse source, a second electron discharge device having a control electrode connected to said second pulse source, means for rendering said first discharge device conductive only upon receipt of a pulse from said first source of pulses, means for rendering said second discharge device conductive only upon receipt of a pulse from said second pulse source, a capacitor operatively connected to said first and second discharge de-

vices, means including a source of potential and resistive means serially connected across said capacitor for charging said capacitor, said capacitor and resistive means having a time constant greater than zero but less than the repetition period of pulses from said first pulse source; means including said first discharge device for discharging said capacitor to a first voltage upon receipt of a pulse from said first pulse source, means including said second discharge device for discharging said capacitor to a second voltage when pulses are simultaneously received from both said pulse sources, a third electron discharge device having an anode, a cathode, and a control electrode connected to said capacitor; an anode-cathode circuit for said third electron discharge device; means for maintaining said third discharge device conductive when said capacitor is charged and non-conductive when said capacitor is discharged, said last named means including fixed bias on said cathode; and means responsive to interruption of current flow in said anode-cathode circuit of said third electron discharge device to develop an output pulse.

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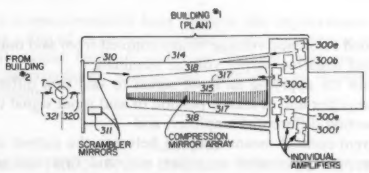
## 4,337,437
## HIGH ENERGY LASER

**Robert O. Hunter, 1811 Verano Pl., Irvine, Calif. 92664, and David L. Fried, 5362 S. Ohio St., Yorba Linda, Calif. 92686**

**Filed Mar. 26, 1979, Ser. No. 23,987**
**Int. Cl.³ H01S** *3/101, 3/23*
**U.S. Cl. 330—4.3** **12 Claims**




**8**. A laser for producing simultaneous compressed optical pulses from a series of sequential pulse of selected temporal spacing comprising in combination:

a plurality of stripper mirrors disposed along the top of said light path having half the spatial separation of said selected temporal spacing;

means for generating an optical pulse for a pulse length at least as long as said compressed optical pulse;

a light compressing path including a plurality of mirrors corresponding in number to said stripper mirrors, each mirror having one half the spatial separation of the selected temporal spatial separation;

a light amplifying path between said stripper mirror and said optical compression network, said light amplifying path including:

a telescope having a primary optic and a secondary optic;

a laser amplifier juxtaposed to said telescope primary optic having an aperture for amplification to permit light of varying angularities to pass through said telescope for amplification;

means for producing a pulse of light having a temporal length at least equal to the duration of the desired compressed optical pulses;

means for directing said light to said stripper mirrors to generate from said stripper mirrors said series of sequential pulses of selected temporal spacing;

at least a first scrambler mirror array having discrete mirrors, each said mirror for directing one of said pulses to the secondary of said telescope at a selected angularity for passage through said telescope;

at least a second scrambler mirror array of discrete mirrors, each mirror for receiving amplified light pulses from said telescope and laser amplifier and directing said light pulse to said light compression path;

and, focusing optics for directing compressed light from said optical compression path and directing light to a target incidence of a compressed optical pulse.

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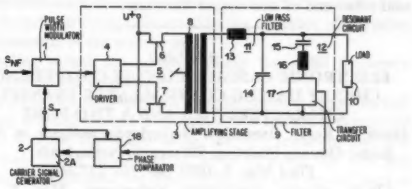
## 4,337,438
## PULSE-WIDTH MODULATOR CIRCUIT

**Walter Guggenbühl, Stäfa, and Mathis Halder, Baar, both of Switzerland, assignors to LGZ Landis & Gyr Zug AG, Zug, Switzerland**

**Filed Feb. 13, 1980, Ser. No. 121,268**
**Claims priority, application Switzerland, Mar. 1, 1979, 2028/79**
**Int. Cl.³ H03F** *3/38*
**U.S. Cl. 330—10** **7 Claims**




**1**. A pulse width, modulated signal amplifier comprising in combination:

a pulse-width modulator, having an input for receiving a low frequency modulation signal, an input for receiving a carrier frequency signal, said modulator generating pulses at said carrier frequency, each pulse having a width modulated by said low frequency modulation signal,

a carrier frequency signal generator having a control input for said carrier frequency and an output connected to the carrier frequency signal input of said pulse-width modulator,

a buffer stage postcoupled to said pulse-width modulator,

an output filter postcoupled to said buffer stage, including relatively narrow-band resonant circuit means having a resonance frequency, for damping and at least partly supressing the carrier frequency, and

regulator means forming a feedback path between said resonant circuit means, and said control input of said carrier frequency signal generator for maintaining the carrier frequency tuned substantially to the resonance frequency of said resonant circuit means.

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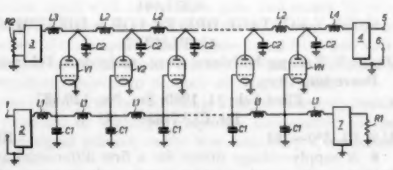
## 4,337,439
## WIDE BAND AMPLIFIERS

**Boleslaw M. Sosin, Chelmsford, England, assignor to The Marconi Company Limited, Chelmsford, England**

**Filed Oct. 24, 1979, Ser. No. 88,063**
**Claims priority, application United Kingdom, Nov. 14, 1978, 44336/78**
**Int. Cl.³ H03F** *3/60, 3/28*
**U.S. Cl. 330—54** **7 Claims**



**1**. A distributed amplifier including a plurality of amplifying devices having their individual control terminals connected to different points along an input filter line which has a predetermined passband, and the output terminals of the amplifying

devices being connected to different points along on an output filter line which has an output load at one end and has a predetermined passband which includes a band of frequencies which is alos included in the passband of the input filter line, said points along the output filter line being so chosen that delays between said output terminals are substantially the same as the delays between the corresponding control terminals, and shunt arms in said filter lines being constituted at least in part by internal capacitances of the amplifying device; said amplifier further comprising a termination impedance connected to the other end of said output filter line, and said output filter line being substantially wholly reactive and being provided with a portion over which its impedance is tapered so as to constitute a wide band multiple quarter wave impedance transformer providing an impedance match between said output load at one end of said output filter line and said termination impedance at said other end of said output filter line.

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**4,337,440**

## ELECTRONIC CASCADE CIRCUIT COMPRISING A CIRCUIT HAVING CONTROLLABLE TRANSFER CHARACTERISTICS AND A TWO-PORT

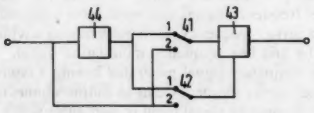
**Jacob de Korte, Breukelen, Netherlands, assignor to Nederlandse Omroep Stichting, Hilversum, Netherlands**

**Filed Mar. 5, 1980, Ser. No. 127,362**

**Claims priority, application Netherlands, Mar. 7, 1979, 7901843**

**Int. Cl.³ H03G *3/20***

**U.S. Cl. 330—129** **4 Claims**




1. An electronic circuit arrangement comprising, in cascade connection:

(a) a first two-port circuit having a first input terminal and a first output terminal;

(b) a second circuit having a second input terminal, an external control terminal and a second output terminal, said second circuit responsive to a control signal applied to its control terminal for controllably varying its transfer characteristics;

(c) said first input terminal comprising an input terminal of said electronic circuit arrangement, and said second output terminal comprising an output terminal of said electronic circuit arrangement;

(d) switching means having a parent contact and first and second switching contacts, said parent contact being connected to said control terminal, said second switching contact being connected to said first input terminal; and

(e) means for providing a connection between said first output terminal and said second input terminal, and said first switching contact.

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**4,337,441**

## SUPPLY-VOLTAGE DRIVER FOR A DIFFERENTIAL AMPLIFIER

**James R. Kellogg, Hillsboro, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.**

**Filed Feb. 11, 1980, Ser. No. 120,587**

**Int. Cl.³ H03F *3/45***

**U.S. Cl. 330—261** **10 Claims**

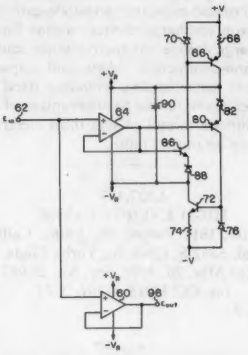
6. A supply-voltage driver for a first differential amplifier having positive and negative supply voltage terminals, comprising:

a second differential amplifier having positive and negative supply voltage terminals connected respectively to the positive and negative supply voltage terminals of said first differential amplifier, said second differential amplifier also having a first input, a second input, and an output, the output being coupled to said second input;

a current source coupled to said positive supply voltage terminals;

a current sink coupled to said negative supply voltage terminals;

first reference voltage means coupled from said output to said positive supply voltage terminals;




second reference voltage means coupled from said output to said negative supply voltage terminals;

means for applying an input signal to said first differential amplifier and at least a portion of said input signal to said second differential amplifier; and

current-control means coupled between the output of said second differential amplifier and said first and second reference voltage means to provide additional current during signal transitions to provide fast slewing of said reference voltage means to track said input signal.

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**4,337,442**

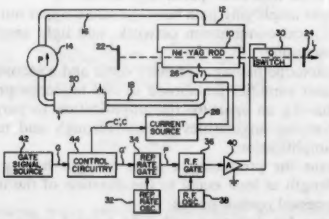
## FIRST LASER PULSE AMPLITUDE MODULATION

**Michael S. Mauck, Portland, Oreg., assignor to Electro Scientific Industries, Inc., Portland, Oreg.**

**Filed Mar. 28, 1980, Ser. No. 134,980**

**Int. Cl.³ H01S *3/13***

**U.S. Cl. 372—13** **7 Claims**




1. In a Q-switched laser having a lasing medium, a continuously pumping source, a Q-switch and a source of electric gating signal for said Q-switch, the combination therewith of electrical control circuit means connected to the pumping source for reducing the pumping level for a time and by an amount sufficient to reduce the energy stored in the lasing medium to a level no greater than the level it normally would recover to during the time between laser pulses at the operating repetition rate and pumping source level, the control circuit means being also connected to the gating signal source for

delaying the gating signal for a time substantially equal to the time during which the pumping level is reduced.

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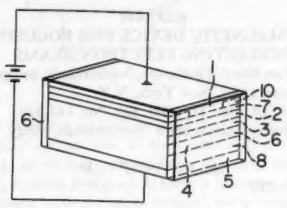
## 4,337,443
## SEMICONDUCTOR LASER DEVICE WITH FACET PASSIVATION FILM

**Jun-ichi Umeda, Hachioji; Toshikazu Shimada; Michiharu Nakamura, both of Hinodemachi; Yoshifumi Katayama, Tokorozawa; Takashi Kajimura, and Shigeo Yamashita, both of Hachioji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Filed Feb. 25, 1980, Ser. No. 124,266**
**Claims priority, application Japan, Feb. 26, 1979, 54-20802**
**Int. Cl.³ H01S *3/19***
**U.S. Cl. 372—49** **9 Claims**




1. In a semiconductor laser element, the improvement comprising a film of an amorphous material deposited on at least an optical output facet of said laser element, said amorphous material containing silicon and hydrogen as indispensable components.

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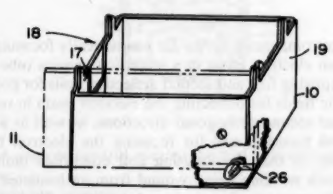
## 4,337,444
## RADIO FREQUENCY OSCILLATOR-MODULATOR CIRCUIT

**Wade B. Tuma, Campbell, and Niles E. Strohl, Sunnyvale, both of Calif., assignors to Atari, Inc., Sunnyvale, Calif.**

**Division of Ser. No. 949,848, Oct. 10, 1978, Pat. No. 4,214,360, which is a division of Ser. No. 818,838, Jul. 25, 1977, Pat. No. 4,152,671. This application Jan. 24, 1980, Ser. No. 114,816**
**Int. Cl.³ H03B *5/12*; H03C *1/44***
**U.S. Cl. 332—31 T** **16 Claims**




1. An oscillator circuit comprising:
a first transistor having a base, an emitter and a collector;
a second transistor having a base dc coupled to the base of the first transistor and directly coupled to the collector of the first transistor, a collector directly coupled to the base of the first transistor and an emitter coupled to the emitter of the first transistor;
a resonant circuit having first and second terminals for providing a relatively high impedance between the terminals at one frequency, the first terminal coupled to the collector of the first transistor and the second terminal coupled to the collector of the second transistor;
current regulating means comprising a first resistor having a first terminal coupled to the emitters of the first and second transistors and having a second terminal; and a diode-coupled transistor coupled in series with a forward biased diode, the series coupled diode-coupled transistor and forward biased diode being connected between the base of the first transistor and the second terminal of the first resistor; and
circuit means for connecting a DC voltage between the base of the first transistor and the second terminal of the first resistor.

11. A radio frequency oscillator-modulator, comprising:
a modulator including a first differentially connected, emitter-coupled transistor pair, the emitters of the first transistor pair being coupled to a modulator input terminal for receiving a modulating signal;
an oscillator for generating a radio frequency signal including a second pair of differentially connected, emitter-coupled transistors having base leads coupled to one another by a resonant circuit, the base lead of each transistor of the second pair being connected to the collector of the other transistor of the second pair;
coupling means for communicating the radio frequency signal to the modulator;
bias means for establishing a predetermined potential including first and second terminals, a fifth transistor connected as a diode, and a first diode, the fifth transistor and first diode being connected in series between the first and second terminals, the bases of the first and second pairs of transistors being dc coupled to the first terminal of the biasing means, the emitters of the second pair of transistors being connected through a load-resistor to the second terminal;
circuit means coupled to the first and second terminals of the bias means for providing a DC voltage thereto; and
output means coupled to the collector of at least one of the modulator transistors for providing a modulated oscillator output signal.

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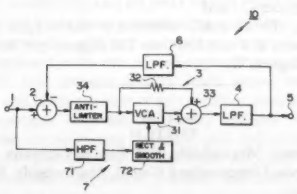
## 4,337,445
## COMPANDER CIRCUIT WHICH PRODUCES VARIABLE PRE-EMPHASIS AND DE-EMPHASIS

**Kenzo Akagiri, Yokohama, Japan, assignor to Sony Corporation, Tokyo, Japan**

**Filed Jan. 21, 1981, Ser. No. 226,822**
**Int. Cl.³ H04B *1/64***
**U.S. Cl. 333—14** **22 Claims**




1. A circuit for noise reduction comprising:
a first signal path including variable gain amplifier means supplied with a subtraction signal for amplifying the subtraction signal with controllable gain, and means for providing substantial de-emphasis of the high frequency components of the amplified subtraction signal from said variable gain amplifier means relative to the low frequency components thereof to produce an output signal;
a second signal path for providing, at most, relatively minor de-emphasis of the high frequency components of the output signal relative to the low frequency components thereof;
subtracting means for subtracting the output of said second signal path from an input information signal and for producing said subtraction signal in response thereto; and
means for controlling the gain of said variable gain amplifier means to exhibit higher gain when the signal level of the

input information signal is relatively high and to exhibit lower gain when said signal level is relatively low.

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**4,337,446**

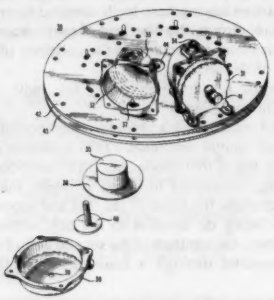
## APPARATUS FOR PROCESSING MICROWAVE ELECTRICAL ENERGY

**Henry M. O'Bryan, Jr., Plainfield, and John Thomson, Jr., Wall Township, Monmouth County, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.**

**Filed Jun. 16, 1980, Ser. No. 160,108**

**Int. Cl.³ H01P** *3/08;* **C01G** *23/00*

**U.S. Cl. 333—238** **8 Claims**



1. An apparatus for processing microwave electrical energy with frequency between 0.5 and 6.0 GHz comprising a dielectric material for interaction with the microwave electrical energy, means for introducing microwave electrical energy into the dielectric material, conducting member to contain the microwave electrical energy in the apparatus in which the dielectrical material comprises at least 80 weight percent ceramic with composition corresponding to nominal formula of $Ba_2Ti_9O_{20}$ characterized in that after sintering into a solid ceramic body the dielectric material is exposed to a heat treatment comprising the steps of

(a) contacting the dielectric material to an oxygen enriched atmosphere consisting of at least 50 volume percent oxygen for at least 6 hours at a temperature between 1100 and 1300 degrees C.; and

(b) cooling the dielectric material in the oxygen enriched atmosphere at a rate less than 200 degrees per hour down to 600 degrees C.

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**4,337,447**

## SWITCH

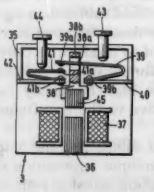
**Helmut Lemmer, Marienheide, Fed. Rep. of Germany, assignor to Starkstrom Gummersbach GmbH, Marienheide, Fed. Rep. of Germany**

**Filed Mar. 12, 1981, Ser. No. 242,853**

**Claims priority, application European Pat. Off., Mar. 13, 1980, 80 101 314.5**

**Int. Cl.³ H01H** *9/20*

**U.S. Cl. 335—167** **11 Claims**



1. In a switch used as a power, control or starter switch of the type including a housing, a contact system mounting in the housing and a magnetic system mounting in the housing for actuating the contact system, wherein the contact system is provided with contact bars having stationary contact pieces as well as bridges having movable contact pieces which act as opening or closing contacts and which are actuated by a common bridge support, with each bridge with its associated contact bar being mounted in a switch chamber and wherein a switch-on contact is provided with a self-locking type contact, the improvement comprising:

a contact yoke for said switch-on contact which is structurally integrated with the switch; and

an externally-operated actuating element for actuating said contact yoke which cooperates with said common bridge support.

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**4,337,448**

## ELECTROMAGNETIC DEVICE FOR FOCUSING AND DEFLECTING ELECTRON BEAMS

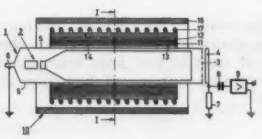
**Henricus J. Van Rooy, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.**

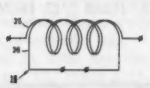
**Filed Apr. 21, 1980, Ser. No. 142,320**

**Claims priority, application Netherlands, May 14, 1979, 7903757**

**Int. Cl.³ H01F** *7/00*

**U.S. Cl. 335—210** **4 Claims**





1. An electromagnetic device for magnetically focusing and deflecting an electron beam in a television camera tube, said device comprising first and second deflection coils for producing magnetic fields for deflecting the electron beam in respective first and second orthogonal directions, as well as a helically wound focusing coil for focusing the electron beam, characterized in that the focusing coil comprises multifilar windings each winding being wound from an insulated conductor in the same winding sense and direction, the windings being located in substantially contiguous relationship throughout their length, each of the windings having a connection at each of its ends, the windings being connected in series in such manner that when energized each winding produces a magnetic field which fields have the same polarity.

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**4,337,449**

## MAGNETIC TRANSDUCER WITH A MOVABLE MAGNET

**Claude Oudet, Besancon, France, assignor to Portescap, La Chaux-de-Fonds, Switzerland**

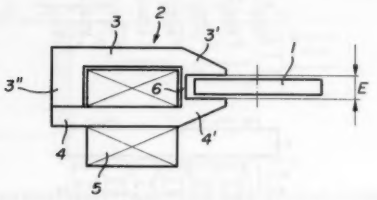
**Filed Jun. 24, 1980, Ser. No. 162,484**

**Int. Cl.³ H01F** *7/08*

**U.S. Cl. 335—225** **1 Claim**

1. A magnetic transducer with a movable magnet, compris-

ing at least one electric coil and a one piece stationary magnetic circuit having a high magnetic permeability and formed of two branches, at least one of which serves as the core of the said coil, the two branches at one end comprising pole pieces defining an air-gap, the movable magnet being disposed so that its magnetic potential is arranged in series with that produced by the stationary magnetic circuit, wherein the said two branches are connected together in the vicinity of the pole pieces by a deformable saturable connecting portion of which the cross-section is substantially smaller than the cross-section




of the said branches so as to be saturated by the magnetic flux in the circuit during use, at least one of the two branches comprising, at its end remote from the pole pieces, a main connecting portion designed to form a junction of a low magnetic resistance with the other branch, the arrangement of the stationary magnetic circuit being such that it may adopt a first configuration in which the coil may be positioned on the branch serving as the core and that it may subsequently be deformed to close the said junction so as to obtain the operational configuration of the magnetic circuit.

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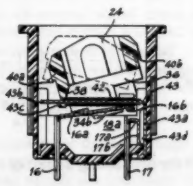
**4,337,450**

## REMOTE CONTROL ELECTRO-THERMAL ACTUATOR SWITCH

**Alan A. Matthies, Milwaukee, Wis., assignor to Eaton Corporation, Cleveland, Ohio**

**Filed Jun. 9, 1980, Ser. No. 157,698**
**Int. Cl.³ H01H *71/16***
**U.S. Cl. 337—66** **4 Claims**




1. A remote control electro-thermal actuator switch comprising:
an insulating housing;
switch contacts mounted in said housing;
an actuator mounted in said housing and manually operable to actuate said contacts to a first position energizing a load device and a second position deenergizing said load device;
and electro-thermal means mounted in said housing and controllable from a remote point for moving said manual actuator from said first position to said second position;
said electro-thermal means comprising a bimetal device mounted in said housing and in engagement with said manual actuator when the latter is in said first position;
and a pair of terminals extending from said housing for connecting said bimetal device to a control means at a remote point;
said bimetal device comprising:
an elongated bimetal element mounted in said housing;
a heater coil in heat conduction relation to said bimetal element;
means connecting one end of said heater coil to one end portion of said bimetal element;
a pair of terminals adapted to be connected to a remote control current source;
means connecting one of said terminals to the other end of said heater coil;
and means connecting said other terminal to the other end of said bimetal element so that current coming to said terminals flows through both said heater coil and said bimetal element.

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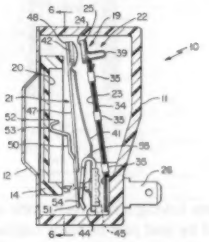
**4,337,451**

## ELECTRICAL SWITCH CONSTRUCTION, SWITCH BLADE SUBASSEMBLY AND METHODS OF MAKING THE SAME

**Raymond J. Fox, Grove City, Ohio, assignor to Robertshaw Controls Company, Richmond, Va.**

**Filed Nov. 26, 1980, Ser. No. 210,522**
**Int. Cl.³ H01H *61/08***
**U.S. Cl. 337—93** **40 Claims**




1. In an electrical switch construction having a housing means carrying a thermally cyclable switch blade means and an adjustable set lever switch blade means cooperable with said cyclable switch blade means when said set lever switch blade means is moved relative to said housing means to an operating position thereof by an actuator means that is carried by said housing means, said housing means carrying calibrating means for calibrating said set lever switch blade means, said set lever switch blade means comprising a resilient switch blade having opposed ends and an ambient bimetal lever means having opposed ends, one of said opposed ends of said switch blade and said ambient bimetal lever means being secured together and being the part of said set lever switch blade means that cooperates with said thermally cyclable switch blade means, the improvement wherein said calibration means is operatively associated with the other opposed end of said ambient bimetal lever means to adjust that other opposed end relative to the other opposed end of said switch blade and thereby calibrate said set point switch blade means, said other opposed end of said switch blade being secured to said construction.

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**4,337,452**

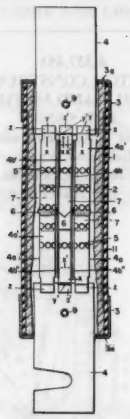
## ELECTRIC FUSE HAVING TERMINAL CAPS AND BLADES PROJECTING THROUGH SAID CAPS

**Frederick J. Kozacka, S. Hampton, and Richard A. Belcher, Hampton Falls, both of N.H., assignors to Gould Inc., Rolling Meadows, Ill.**

**Filed Mar. 11, 1981, Ser. No. 242,813**
**Int. Cl.³ H01H *85/16***
**U.S. Cl. 337—231** **11 Claims**

1. An electric fuse comprising in combination
(a) a tubular casing of electric insulating material;
(b) a pulverulent arc-quenching filler inside said casing;

(c) a pair of terminal caps closing said casing at the ends thereof;
(d) a pair of blade contacts projecting from the outside of said casing through the end surfaces of said pair of terminal caps into the inside of said casing;
(e) a plurality of fusible elements having substantially the same resistance;
(f) some of said plurality of fusible elements having a relatively narrow spacing from the plane defined by said pair of blade contacts, and others of said plurality of fusible



elements having a relatively wide spacing from the plane defined by said pair of blade contacts; and
(g) a plurality of pairs of connectors for connecting the ends of each of said plurality of fusible elements to said pair of blade contacts, the resistance of each of said plurality of pairs of connectors being such that the resistance of the current path through each of said plurality of fusible elements is virtually equal, irrespective of the spacing of each of said plurality of fusible elements from the plane defined by said pair of blade contacts.

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**4,337,453**

**FUNDAMENTAL ELECTRICAL ELEMENT ARRAY**

**Kazuyoshi Nagashima, Nirasaki, and Nobuyuki Furuya, Kohfu, both of Japan, assignors to Fuji Sangyo Kabushiki Kaisha, Yamanashi, Japan**

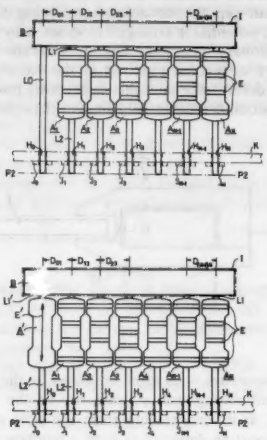
**Filed Mar. 5, 1980, Ser. No. 127,503**

**Claims priority, application Japan, Mar. 8, 1979, 54-27016; Mar. 8, 1979, 54-27017; Mar. 8, 1979, 54-27018; Mar. 8, 1979, 54-27019; Aug. 31, 1979, 54-111333; Aug. 31, 1979, 54-111334**

**Int. Cl.³ H01C** *1/01*

**U.S. Cl. 338—320** **9 Claims**

1. A fundamental electrical element array comprising:
a plurality of columnar, fundamental electrical elements, each provided with wire leads extending from its both ends concentrically therewith;
at least one lead wire; and
a conductive bar common to the plurality of fundamental electrical elements and the lead wire;
wherein the plurality of fundamental electrical elements and the leads wire are electrically and mechanically connected at one wire end to said conductive bar at predetermined



intervals in the lengthwise direction of the conductive bar so that they lie side by side in a common plane.

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**4,337,454**

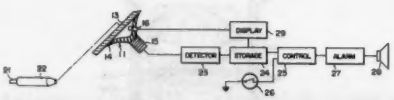
**ALARM UNIT FOR PREVENTING THEFT OF VEHICLES**

**Keisuke Iwata, Tokyo, Japan, assignor to Iwata Electric Co., Ltd., Tokyo, Japan**

**Filed Apr. 6, 1981, Ser. No. 251,210**

**Int. Cl.³ B60R** *25/10*

**U.S. Cl. 340—63** **5 Claims**




1. An alarm unit for preventing a theft of a vehicle, comprising
a portable signal emitter for producing a magnetic signal of a predetermined frequency,
a receiver mounted within the vehicle on a glass pane thereof for receiving the magnetic signal from the emitter through the glass pane,
a signal detector connected to the receiver for determining whether the magnetic signal has the predetermined frequency and for producing a control signal when the signal has the predetermined frequency,
a circuit connected to the signal detector for storing the control signal therefrom,
a control circuit connected to the storing circuit and a door switch which is responsive to the opening or closing of a door of the vehicle, the control circuit producing an output signal in response to an operation of the door switch after the storing circuit has stored the incoming control signal,
and an alarm circuit connected to the control circuit and responsive to the output signal.

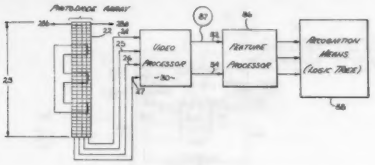
## 4,337,455
## APPARATUS FOR PROCESSING VIDEO SIGNALS RECEIVED FROM AN OPTICAL SCANNER

**William R. Smith, Mountain View, Calif., assignor to Caere Corporation, Los Gatos, Calif.**

**Continuation of Ser. No. 45,103, Jun. 4, 1979, abandoned, which is a division of Ser. No. 898,822, Apr. 21, 1978, Pat. No. 4,180,799. This application Jan. 2, 1981, Ser. No. 222,268**

**Int. Cl.³ G06K** *9/38*

**U.S. Cl. 340—146.3 AG** **1 Claim**




1. In an apparatus for recognizing characters, such as alphanumeric characters, an improved video processor for processing video signals corresponding to slices of said characters received from an optical scanner having a plurality of parallel linear arrays comprising:

comparator means for comparing said video signals with a dynamic threshold voltage, said comparator means coupled to receive said video signals;

threshold generation means coupled to said comparator means for generating said dynamic threshold voltage for said comparator means, said threshold generation means coupled to receive said video signals and including circuit means responsive to the peaks of said video signals so as to set said threshold voltage in response to said peaks, said peaks corresponding to portions of said characters within said vertical slices, said circuit means causing said threshold voltage to decay at a predetermined rate after each of said peaks such that said dynamic threshold voltage is a function of the magnitudes of said peak;

clamping means coupled to said comparator means for providing a lower limit for said threshold voltage, said clamping means coupled to and controlled by a first peak follower circuit which follows said peaks of said video signals, whereby an output signal from said processor is prevented when video signals received from said scanner are below a predetermined level; and

a weighting network which weights signals from said arrays in a predetermined manner to provide smoothing and averaging of the signals received from the plurality of linear arrays;

whereby compensation for dynamic range variations of said video signals is provided at the output of said comparator means since said signals are compared with said dynamic threshold voltage.

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## 4,337,456
## ANALOG TO DIGITAL CONVERTER WITH OFFSET ERROR CORRECTION

**George W. Deffendall, Reading, and James J. Hitt, Willow Grove, both of Pa., assignors to Leeds & Northrup Company, North Wales, Pa.**

**Filed Apr. 16, 1979, Ser. No. 30,197**

**Int. Cl.³ H03K** *13/20*

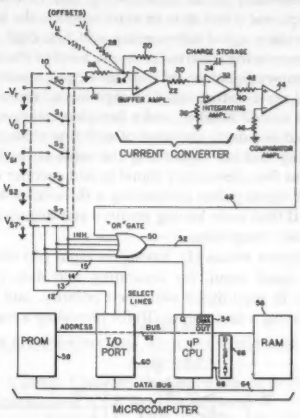
**U.S. Cl. 340—347 NT** **3 Claims**

1. A method for producing a digital signal of value indicative of the value of an unknown analog voltage which employs a charge storage device coupled to the output of a current converter of the type which produces offsetting currents in said device comprising the steps of:

applying a datum level voltage $V_O$ to the input of said current converter for a predetermined time period $t_2$ which is equal to a constant k times a predetermined time period $t_1$ whereby during said period the charging current in said device due to said voltage and the offsetting current produce a voltage across said storage device which changes from a first voltage level to a second voltage level;

discharging said device at a known rate by the application of a reference voltage $V_r$ to the input of said converter for the time $t_0$ required to change the voltage across said storage device from said second back to said first level;

applying said unknown analog voltage $V_S$ to the input of said current converter for said predetermined time period $t_1$ measured from the time the voltage across said device is at said first level, whereby during said period the charging current in said device due to said unknown analog voltage




and the offsetting currents produces a change in the voltage across said device to a third level;

discharging said device at said known rate by the application of the reference potential $V_r$ to the input of said converter for the time $t_3$ required to change the voltage across said storage device from said third level back to said first level; and

producing said digital signal to have a value proportional to the reference voltage times the ratio of the period $t_3$ to the period $t_1$ as corrected for the value of said offsetting currents by the reduction of the value of $t_3$ by an amount $t_0/k$ and the increase of the value $t_1$ by an amount $t_0/k$ where k equals $t_2/t_1$.

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## 4,337,457
## METHOD FOR THE SERIAL TRANSMISSION OF BINARY DATA AND DEVICES FOR ITS IMPLEMENTATION

**Jean-Paul Tache, Lieu dit Moncey Saint-Laurent d'Agny, France, assignor to Compagnie Lyonnaise de Transmissions Optiques, Clichy, France**

**Filed Jan. 21, 1980, Ser. No. 114,013**

**Claims priority, application France, Jan. 30, 1979, 79 02262**

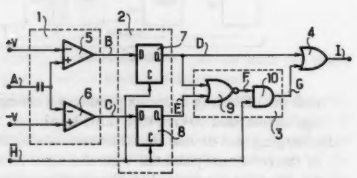
**Int. Cl.³ H03K** *13/24*

**U.S. Cl. 340—347 DD** **10 Claims**

1. An encoder for receiving data input signal pulses representing a series of binary data digits having first and second values, said series including at least first and second sequences of (n+1) successive binary digits of said second value, said first sequence preceding said second sequence and each of said sequences having first and last digits, m digits of said first value occurring in said series between said first and second sequences, where m is a non-negative integer, said encoder providing an encoder output signal representing said data input signal and comprising a series of first and second elementary signals each having at least one of first and second levels and occupying a

time interval known as the binary interval, said first elementary signals having only one of said first and second levels for the duration of said binary interval and said second elementary signals having said first level during the first half of said binary interval and said second level during the second half of said binary interval, said encoder output signal comprising a first elementary signal representing each binary data digit of said first value, the level of said first elementary signal representing a digit of said first value being different from the level of the most recent preceding first elementary signal in said encoder output, a second elementary signal representing each binary data digit of said second value, except said first and last digits, a first elementary signal representing said first digit in said second sequence when m is an even number, the level of said first elementary signal representing said first digit in said second sequence being different from the level of the most recent first elementary signal in said encoder output, a second elementary signal representing said first digit in said second sequence when m is an odd number, and a first elementary signal representing said last digit, the level of said first elementary signal representing said last digit being the same as the level of the most recent first elementary signal in said encoder output, said data input signal pulses comprising a three-level high-density bipolar (HDBn) code having positive and negative polarities, said encoder comprising:

discriminator means (**1**), having an input (A) receiving said data signal input, for separating said data input signal pulses in accordance with their polarity, said discriminator having a first output (B) for providing a train of pulses



having one polarity and corresponding to said data input signal pulses having positive polarity, and a second output (C) for providing a train of pulses of said one polarity and corresponding to data input signal pulses having a negative polarity;

a clock signal generator for generating an encoder clock input;

a double shaping circuit (**2**), connected to said first and second outputs of said discriminator and to said encoder clock input (H), said double shaping circuit under the action of said clock input expanding the pulse trains appearing at the first and second outputs of said discriminator and providing said pulses with a duty factor of **1/1**, said double shaping circuit having a first output (D) for providing a first train of expanded pulses representing pulses of said data input signal of positive polarity and a second output (E) for providing a second train of expanded pulses corresponding to pulses in said data input signal having negative polarity;

a gating circuit (**3**), receiving said first and second expanded pulse trains and said encoder clock input, said gating circuit having an output (G) and providing under the action of said clock signal a train of pulses having a duty factor of $\frac{1}{4}$ during the absence of pulses in said first and second expanded pulse trains; and

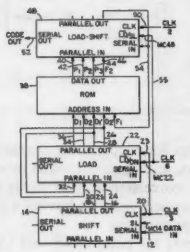
an adder (**4**) receiving the output (G) of said gating circuit and also receiving said first expanded pulse train, the output of said adder comprising said encoder output signal.

**4,337,458**

## DATA ENCODING METHOD AND SYSTEM EMPLOYING TWO-THIRDS CODE RATE WITH FULL WORD LOOK-AHEAD

**Martin Cohn, Arlington, Mass.; George V. Jacoby, Los Altos, and Charles A. Bates, III, San Jose, both of Calif., assignors to Sperry Corporation, New York, N.Y.**

**Filed Feb. 19, 1980, Ser. No. 122,632**
**Int. Cl.³ H03K *13/24***
**U.S. Cl. 340—347 DD** **7 Claims**

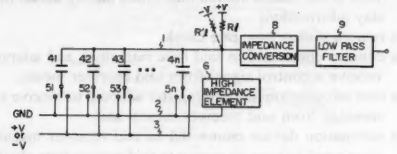


**1**. Apparatus for encoding binary data in the form of serially occurring binary data bits to a series of signal transitions in order to effect high density transmission of data to a limited bandwidth system comprising: means for forming the binary data bits into data words composed of 2 bits, storage means having an input coupled to said data word forming means for sequentially receiving and storing data words from said data word forming means, said storage means having a present data word output and a succeeding data word output and being adapted to shift a data word stored therein to said present data word output in response to input from said data word forming means of a succeeding data word so that a present data word and a succeeding data word are simultaneously accessible at said present data word and succeeding data word outputs respectively, conversion means having inputs coupled to said storage means present data word and succeeding data word outputs for converting said present data word output into a present code word having 3 bits in 3 positions, said conversion means being constructed and arranged in accordance with an encoding scheme to form the present code word to have at least one binary ONE and to lack successive binary ONEs, said conversion means including means for producing a flag signal in response to occurrence of binary ONEs in both the third position of said present code word and the first position of a tentative code word representative in accordance with the encoding scheme of the succeeding data word, means for applying the flag signal to said conversion means during the time when a succeeding data word is applied to said conversion means, means for transmitting said present code word from said conversion means in serial form and for coupling said flag signal to said conversion means simultaneous with introduction of a new data word to said storage means and shifting of the succeeding word to said present data word output, said conversion means being constructed and arranged to form a succeeding code word representative of the succeeding data word at said present data word output so that the succeeding code word is composed of 3 binary ZEROs in response to presence of said flag signal and of 3 code bits according to the encoding scheme in absence of the flag signal, and means for serializing the code words into a series of code bits for transmission to the system.

## 4,337,459
## DIGITAL-TO-ANALOG CONVERTER

**Masauki Takahasi, Utsunomiya; Hisami Tanaka, Yokohama; Masao Yamasawa, Sagamihara, and Michinobu Ohhata, Kawasaki, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan**

**Filed May 16, 1980, Ser. No. 150,679**
**Claims priority, application Japan, May 18, 1979, 54-61336**
**Int. Cl.³ H03K *13/02***
**U.S. Cl. 340—347 DA** **5 Claims**




**1**. A digital-to-analog converter comprising an output conductor, a ground conductor, a power source conductor, a plurality of series connections of capacitors and switches connected between said output conductor and either of said ground conductor and said power source conductor, and an impedance conversion circuit connected directly to said output conductor, said output conductor producing the converted analog signals in accordance with the switching of said switches by digital input signals, characterized in that:

a high impedance element is connected between said output conductor and said ground conductor, said high impedance element being maintained in the conductive state throughout the operation and the nonoperation periods after the digital-to-analog converting operation of said digital-to-analog converter, the value of said high impedance being smaller than the leakage resistance of said output conductor and being large enough to make the fluctuation of the potential of the output conductor due to said high impedance negligible during the digital-to-analog converting operation of said digital-to-analog converter.

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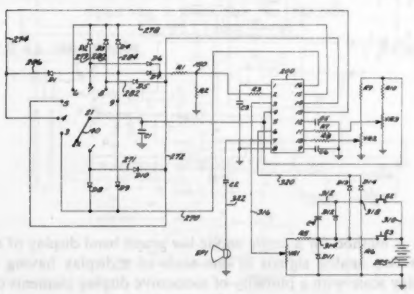
## 4,337,460
## HAND-HELD SOUND EFFECTS DEVICE

**Jay Smith, III, Pacific Palisades, and Jeffrey M. Moskin, Los Angeles, both of Calif., assignors to Smith Engineering, Santa Monica, Calif.**

**Filed Jan. 25, 1980, Ser. No. 115,356**
**Int. Cl.³ G08B *3/10***
**U.S. Cl. 340—384 E** **1 Claim**



**1**. A circuit for generating a plurality of sounds in dependance on operator control, powered by an electrical power source and comprising:

audio signal generator means including noise generator, low frequency audio oscillator, voltage controlled oscillator and mixing means for mixing the outputs of the noise generator, low frequency oscillator and voltage controlled oscillator;

amplifier means for amplifying the output of said audio signal generator;

sound selector means coupled to said mixing means, said selector means adapted for operator selection of the respective ones of said noise generator and said oscillators to be mixed;

pitch control means coupled to said voltage controlled oscillator, adapted for operator control of the pitch of said voltage controlled oscillator;

oscillation rate control means coupled to said low frequency oscillator, adapted for operator control of the oscillation rate of said low frequency oscillator; and

audio transducer means coupled to the audio output of said audio amplifier means; all of said above means adapted for inclusion in a housing to be hand-held by operator,

the sound generating circuit further comprising switch means for coupling such electrical power source to the circuit, said switch adapted to provide power to the circuit only when held in a closed position by the operator.

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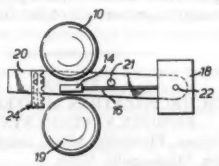
## 4,337,461
## VOLUME CONTROL MECHANISM FOR A BELL ASSEMBLY

**John A. Carrier, Chilwell, England, assignor to Plessey Handel und Investments A.G., Zug, Switzerland**

**Filed Jul. 7, 1980, Ser. No. 166,327**
**Claims priority, application United Kingdom, Jul. 10, 1979, 7924064**
**Int. Cl.³ G10K *1/063***
**U.S. Cl. 340—402** **3 Claims**

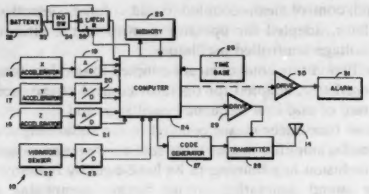



**1**. A volume control mechanism for a bell assembly having at least one bell dome and a bell ringer hammer supported on the end of a pivoted stem, comprising a resilient member, said resilient member being movable into contact with said stem to apply different predetermined forces to said stem so as to vary the amplitude of movement of said stem and said ringer hammer when in operation, a lever, said lever being pivoted adjacent to said stem pivot in the same plane as said stem and supporting said resilient member, a resilient rod and a rigid rod, said resilient rod and said rigid rod being secured to said lever with their axes perpendicular to the plane of movement of said lever, a block, said block being fixed relative to the at least one bell dome and having guide means for guiding said rigid rod and a plurality of grooves formed thereon, the axes of said grooves being perpendicular to the plane of movement of said lever, said resilient rod engaging said grooves being perpendicular to the plane of movement of said lever, said resilient rod engaging said grooves formed in said block and said rigid rod engaging said guide means formed in said block, whereby said rigid rod in said guide means maintains said resilient rod in contact with said grooves at all times.

## 4,337,462
## THEFT DETECTION SYSTEM AND METHOD

Jerome H. Lemelson, 85 Rector St., Metuchen, N.J. 08840

Continuation-in-part of Ser. No. 858,669, Dec. 27, 1977. This application Nov. 3, 1980, Ser. No. 202,885
Int. Cl.[3] G08B *13/14*
U.S. Cl. 340—572 13 Claims




1. A theft detection system comprising in combination with a movable object to be protected against theft, said system including;

first means for detecting the motion of said object when said object is moved away from an at-rest location,

said first means including means for generating analog electrical signals which are indicative of the motion of said objects from and beyond said at-rest location,

second means for receiving said analog signals and digitizing same to generate digital signals representative of said analog signals,

third means including electronic computing means for receiving the digital signals generated by said second means and generating control signals,

fourth means for receiving said control signals and operative to generate code signals,

fifth means for short wave transmitting said code signals,

sixth means including short wave receiving means for receiving said short wave transmitted code signals, and

seventh means including an alarm means connected to said short wave receiving means for receiving and using the code signals received thereby and generating an indication of an attempt to move said object from said at-rest location.

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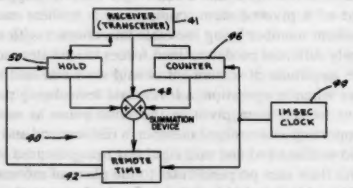
## 4,337,463
## TIME SYNCHRONIZATION MASTER STATION AND REMOTE STATION SYSTEM

Robert F. Vangen, Plymouth, Minn., assignor to Control Data Corporation, Minneapolis, Minn.

Filed Aug. 22, 1980, Ser. No. 180,243
Int. Cl.[3] H04Q *9/00*
U.S. Cl. 340—825.3 2 Claims




1. A time synchronization system comprising a master station and a remote station so that the actual time of day information in a remote station clock can be adjusted to be the same as the master station time clock comprising:

a master station transmitter means for generating a master station time message,

a master station time clock having actual time of day information,

a holding register connected with said transmitter means and connected with the master station time clock for holding the actual time of day information indicated by said clock at the time a predetermined portion of the time message is sent and in which the contents of said holding register are sent as the time portion of the time message at a time subsequent to the predetermined portion of the time message,

a remote station receiver means for receiving a time message,

a remote station time clock to be adjusted to be the same time as the master station time clock having actual time of day information,

a remote station base rate clock,

a counter connected to said base rate clock and adapted to receive a control signal from said receiver means,

a time information holding register adapted to receive a time message from said receiver means, and

a summation device connected to said receiver means and connected to have an output to said remote time clock and having inputs connected to said holding register and said counter so that the time portion of said time message is entered into said holding register by said remote station receiver and so that said counter is actuated to count at the rate of the remote station base rate clock commencing at the predetermined portion of the time message received; wherein, at the conclusion of said time message the summation device adds the contents of said holding register and said counter and enters them into the remote station time clock as the current updated actual time of day.

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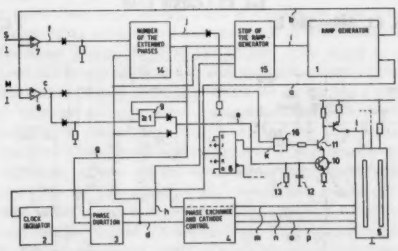
## 4,337,464
## METHOD AND CIRCUIT FOR CONTROLLING A BAND DISPLAY OF A PLURALITY OF ANALOG SIGNALS USING A SINGLE ANODE TYPE BAR GRAPH DEVICE

Ilkka Karaila, Pirkkala, and Antero Hälikkä, Tampere, both of Finland, assignors to Valmet Oy, Finland

Filed Dec. 26, 1979, Ser. No. 107,389
Claims priority, application Finland, Dec. 29, 1978, 784059
Int. Cl.[3] G09G *3/00*
U.S. Cl. 340—753 11 Claims




1. A method for a single anode bar graph band display of at least two analog signals in one scale of a display having a display scale with a plurality of successive display elements of which a part defined by an analog signal in each scanning cycle is made luminous by a specified scanning frequency to produce an analog display, said method comprising

changing the current supply to the display elements; and

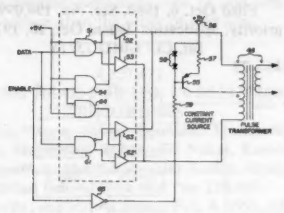
changing the scanning speed of said display elements,

whereby a three level variation of light intensity is obtained on the same display scale.

## 4,337,465
## LINE DRIVER CIRCUIT FOR A LOCAL AREA CONTENTION NETWORK

John E. Sprackles, San Diego, Calif., and Mark L. C. Gerhold, Paoli, Pa., assignors to Burroughs Corporation, Detroit, Mich.

Filed Sep. 25, 1980, Ser. No. 190,568
Int. Cl.[3] H04Q 9/00; H04L 5/14; H03K 17/56
U.S. Cl. 340—825.03 7 Claims



1. A station in a local area data communication network coupled to a local area communication channel, said station comprising:

sensing means to detect when said channel is inactive;

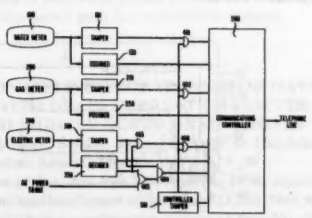
clock means to determine a random period of time after said sensing means detects no activity on said channel; and

transmitting means to transmit an information packet on said channel after said random period of time and when there is no activity on said channel, said transmitting means including line driver means comprising: a pulse transformer having a primary winding with a center tap and a secondary winding, said secondary winding being coupled to said communication channel; a constant current source coupled to said center tap of said primary winding; and circuit means coupled to the respective ends of said primary winding to receive current from one end thereof or the other end thereof in accordance with a data signal to be transmitted on said channel so as to cancel out signals being transmitted by other stations contending for access to said channel.

## 4,337,466
## TAMPER PROTECTION FOR AN AUTOMATIC REMOTE METER READING UNIT

Gary L. Spahn, Fortville, Ind., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Sep. 2, 1980, Ser. No. 183,363
Int. Cl.[3] G08B 21/00
U.S. Cl. 340—870.09 9 Claims



1. A tamper protection arrangement for a remote meter reading unit, the arrangement comprising:

an encoder (302) at a remote location for receiving an output signal of an associated meter (300), the output signal of the meter reflecting the usage of a specific unit quantity and the encoder changing the output signal of the meter into a form suitable for sending over a transmission line (370);

a decoder (350) connected to the transmission line for receiving the output signal from the encoder section CHARACTERIZED IN THAT

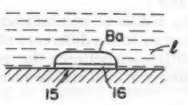
the encoder includes clocking means (300, 330, 340) for providing a control signal consisting of clock pulses of a first time period, a second time period, or a third time period over the transmission line; and

the decoder includes a first detector (389–394) responsive to clock pulses of the second time period, and a second detector (380–385) responsive to pulses of the third time period, pulses with the second time period being reflective of the usage of a specific unit quantity measured by the meter, and pulses with the third time period being reflective of a tamper to the meter reading unit.

## 4,337,467
## LIQUID JET RECORDING PROCESS

Yasuhiro Yano, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 24, 1980, Ser. No. 133,142
Claims priority, application Japan, Aug. 10, 1979, 54-102487
Int. Cl.[3] G01D 15/18
U.S. Cl. 346—1.1 1 Claim




1. A liquid jet recording process utilizing a recording head comprising a liquid ejecting portion including an orifice for ejecting a liquid droplet at the end, a heat actuating portion forming a part of the liquid path and communicating with the orifice, a heating surface constituting at least one portion of the inner wall of the heat actuating portion, and an electrothermal transducer comprising a resistive heater and electrodes applying an electric signal to the resistive heater layer to generate heat at said layer and the generated heat being transferred to the heating surface, which comprises:

filling the liquid path of the liquid ejecting portion with the liquid, raising the temperature of the heating surface to a temperature higher than the temperature range at which a spherical bubble is formed by applying to the electrothermal transducer an electric signal of a level capable of making the temperature-rise per unit time of the temperature of the heating surface rapid at a region where the temperature rise curve crosses the temperature region at which a spherical bubble is formed so as to substantially suppress the formation and growing of the spherical bubble, thereby forming a semi-pillow type bubble extending over substantially the entire area of the heating surface, ejecting the liquid from the orifice by the force generated due to the formation of the bubble to propel a liquid droplet toward a recording member, and supplying make-up liquid to the heat actuating portion after the ejection of the liquid droplet.

## 4,337,468
## METHOD AND DEVICE FOR CONTROLLING CONCENTRATION OF INK FOR INK-JET PRINTER

Akinori Mizuno, Yokohama, Japan, assignor to Ricoh Co., Ltd., Tokyo, Japan

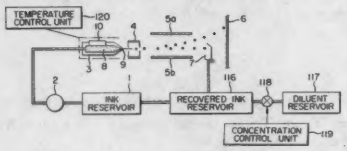
Filed Nov. 7, 1980, Ser. No. 204,741
Claims priority, application Japan, Nov. 16, 1979, 54/147709
Int. Cl.[3] G01D 15/18
U.S. Cl. 346—1.1 3 Claims

1. A method for controlling the concentration of ink in an ink-jet printer of the type in which the ink is supplied from an

ink reservoir to an ink drop generator which in turn emits a continuous jet of ink which in turn breaks up into a stream of ink drops by the synchronizing signal applied by a piezoelectric crystal to the ink drop generator and the ink drops are selectively charged by a charge electrode so that the charged or uncharged ink drops are placed on a recording sheet and the uncharged or charged ink drops are collected and recovered into said ink reservoir,

characterized by

measuring the quantity of ink emitted from the ink drop generator based on the number of vibrations per unit time interval of said piezoelectric crystal,




measuring the quantity of ink used in printing based on the number of times per said unit time interval the charge electrode has or has not charged the ink drops, measuring the quantity of ink actually recovered in a recovered ink reservoir, and

supplementing a diluent into said recovered ink reservoir equal in quantity to the difference obtained by subtracting from the difference between the quantity of emitted ink and the quantity of used ink the quantity of actually recovered ink.

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**4,337,469**

## INK LIQUID SUPPLY SYSTEM FOR INK JET SYSTEM PRINTER

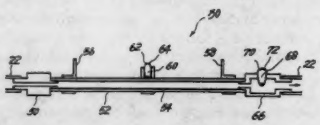
**Rikuo Takano, Musashino, and Yuji Sumitomo, Nara, both of Japan, assignors to Nippon Telegraph and Telephone Public Corp. and Sharp Kabushiki Kaisha, both of Osaka, Japan**

**Continuation of Ser. No. 610,779, Sep. 5, 1975, abandoned. This application Dec. 27, 1977, Ser. No. 864,438**

**Claims priority, application Japan, Sep. 6, 1974, 49-103311**

**Int. Cl.³ G01D *15/18***

**U.S. Cl. 346—75** **10 Claims**




1. In an ink liquid supply system for an ink jet system printer which emits ink droplets from a nozzle toward a recording paper, selectively deflects said ink droplets by a deflection means, and prints desired symbols on said recording paper with said deflected ink droplets, the improvements comprising:

a. an ink liquid reservoir for containing the ink liquid therein;

b. means including a heat generating pipe for supplying ink to said nozzle;

c. a first conduit means for connecting said ink liquid reservoir with said heat generating pipe;

d. a second conduit means for connecting said heat generating pipe with said nozzle; and

e. a control circuit means for controlling the power supply to said heat generating pipe including a protect temperature sensing means operatively connected to said heat generating pipe for preventing accidental temperature fluctuations of said heat generating pipe and an ink liquid temperature sensing means for regulating the temperature of the said heat generating pipe in order to warm the ink liquid to a predetermined temperature and stabilize the viscosity and surface tension of said ink liquid supplied to said nozzle.

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**4,337,470**

## INK JET PRINTING APPARATUS WITH VARIABLE CHARACTER SIZE

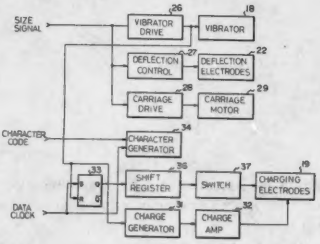
**Tatsuya Furukawa, c/o Ricoh Company, Ltd., 3-6, 1-chome Nakamagome, Ota-ku, Tokyo, Japan**

**Filed Oct. 6, 1980, Ser. No. 194,099**

**Claims priority, application Japan, Oct. 13, 1979, 54-132186**

**Int. Cl.³ G01D *15/18***

**U.S. Cl. 346—75** **4 Claims**




1. An ink jet printing apparatus including an ink jet head, vibrator means for applying pressure oscillation to ink in the ink jet head thereby causing the ink to be ejected from the ink jet head and separated into droplets, charging means for charging the ink droplets, deflection means for deflecting the charged ink droplets and carriage means for producing relative movement between the ink jet head and a sheet against which the ink is ejected for printing, characterized by comprising:

control means for controlling a size of images printed by the printing apparatus, the control means varying a frequency of pressure oscillation of the vibrator means and thereby a printed dot size in accordance with a desired image size and controlling an amount of deflection of the ink droplets and a speed of movement of the carriage means in accordance with the desired image size.

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**4,337,471**

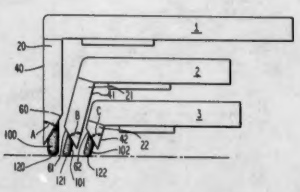
## DISPOSABLE MARKERS ADAPTED FOR CONSTANT WIDTH AND CLOSE PROXIMITY TRACING

**James R. Hubbard, Moorestown; George M. Sarkisian, Willingboro, both of N.J., and John J. Scanlon, Philadelphia, Pa., assignors to Graphic Controls Corporation, Cherry Hill, N.J.**

**Filed Sep. 29, 1980, Ser. No. 191,720**

**Int. Cl.³ G01D *15/16***

**U.S. Cl. 346—140 R** **8 Claims**




1. A disposable marker consisting of a nib shank surrounding and supporting a nib having a writing tip, and adjacent thereto along a common side therewith, a second disposable marker tip consisting of a nib shank surrounding and supporting a nib having a writing tip wherein said first and second marker tips are adapted to write on a common writing surface and to pass

one another in close proximity at their adjacent common side, and are angularly disposed with respect to one another, wherein both said first and second nib shanks terminate to form nib shank bottom surfaces and wherein at least one of said nib shanks terminates on said adjacent side thereof further from said writing surface than on the side thereof opposite said adjacent side to minimize interference therewith upon close proximity passage, wherein at last one of said nibs includes a spherical tip adapted to lay down a constant width trace independent of its angular disposition, one of said nibs having a smaller cross section than the other of said nibs.

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**4,337,472**

## RECORDING HEAD FOR USE IN ELECTROSTATIC RECORDERS

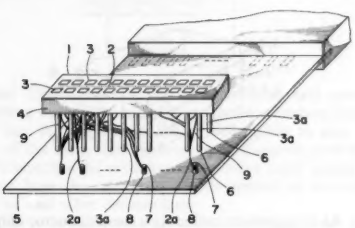
**Youiti Shimizu, Nara; Takeo Tsumura, Moriguchi; Tadashi Matsumoto, Matsubara, and Syunzi Nakai, Kashiwaa, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan**

**Filed Feb. 6, 1980, Ser. No. 118,869**

**Claims priority, application Japan, Feb. 6, 1979, 54-14818[U]**

**Int. Cl.³ G10D** *15/06*

**U.S. Cl. 346—155** **3 Claims**




1. A recording head assembly for an electrostatic recorder comprising:

a plurality of pin electrodes arranged substantially colinearly and spaced apart from each other;

a plurality of auxiliary electrodes arranged on either side of said colinearly arranged pin electrodes;

a circuit board;

lead frame means for electrically interconnecting said auxiliary electrodes to said circuit board and for physically spacing said pin electrodes and auxiliary electrodes from said circuit board;

connection stud means disposed on said circuit board for receiving signals from said pin electrodes; and

a plurality of conductive wires, each connected at a first end to one of said pin electrodes and connected at a second end opposite the first end to said connection stud means;

said lead frame means constraining said conductive wires to guide each of said wires to said connection stud means via a relatively direct path for connection thereto.

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**4,337,473**

## JUNCTION FIELD EFFECT TRANSISTOR HAVING UNSATURATED DRAIN CURRENT CHARACTERISTIC WITH LIGHTLY DOPED DRAIN REGION

**Jun-ichi Nishizawa, Sendai, Japan, assignor to Handotai Kenkyu Shinkokai, Sendai, Japan**

**Continuation of Ser. No. 569,741, Apr. 21, 1975, abandoned, which is a continuation-in-part of Ser. No. 413,266, Nov. 6, 1973, abandoned, which is a continuation-in-part of Ser. No. 248,022, Apr. 27, 1972, abandoned. This application Jul. 19, 1977, Ser. No. 817,052**

**Claims priority, application Japan, Apr. 28, 1971, 46-28405**

**Int. Cl.³ H01L** *29/80*

**U.S. Cl. 357—22** **6 Claims**

1. In a field effect transistor of the type including:

a semiconductor region of first conductivity type,

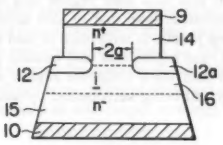
said semiconductor region having opposite longitudinal ends and opposite transverse sides,

respective source and drain semiconductor regions provided at said opposite longitudinal ends of said semiconductor region, respectively,

gate means, including respective gate semiconductor regions of a second conductivity type, disposed at said opposite transverse sides of said semiconductor region, for forming a channel in said semiconductor region between said gate semiconductor regions,

said drain and said gate means being adapted to be applied with a drain voltage and a gate voltage from external voltage sources, respectively, said channel having a width defined by the distance between said gates, the improvement wherein:

said semiconductor region is formed of a semiconductor material having a low impurity concentration and includes an intrinsic semiconductor region having first and second opposing surfaces and an impurity concentration of about




$10^{12}$ atoms/cm$^3$, a highly doped layer of said first conductivity type having an impurity concentration of approximately $10^{19}$ atoms per cm$^3$ and provided on said first surface of said intrinsic semiconductor region, and a lightly doped layer of said first conductivity type having a maximum impurity concentration throughout of approximately $10^{15}$ atoms per cm$^3$, and provided on the second surface of said intrinsic semiconductor region, said gates being positioned along a boundary region between said highly doped layer of said first conductivity type and said intrinsic semiconductor region,

the product of the series resistance and the true transconductance of said field effect transistor being maintained less than one in the operative state of said transistor in which state a drain current is flowing to provide an unsaturated drain current versus drain voltage characteristic for any operative value of gate voltage; and

said series resistance being the sum of the resistance of the source region, the resistance from the source region to the channel, and the resistance of the channel.

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**4,337,474**

## SEMICONDUCTOR DEVICE

**Yoshinori Yukimoto, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan**

**Filed Aug. 28, 1979, Ser. No. 71,031**

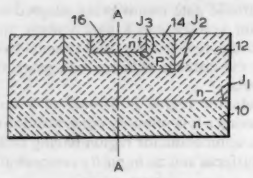
**Claims priority, application Japan, Aug. 31, 1978, 53/107114; Sep. 14, 1978, 53/112937**

**Int. Cl.³ H01L** *29/80*

**U.S. Cl. 357—22** **1 Claim**

1. A semiconductor device comprising, in combination, a first collector region of a first type conductivity, a second collector region having the first type conductivity and disposed on said first collector region and forming a first junction therebetween, said second collector region having an impurity concentration less than the impurity concentration of said first collector region, a base region of a second type conductivity disposed adjacent to said second collector region and forming a second junction therebetween, an emitter region of the first type conductivity disposed adjacent to said base region and forming a third junction therebetween and positioned for forming a current path along which a current flows between said emitter region and said first and second collector regions and

also forming fourth junctions between said emitter region and said second collector region, and an annular gate region of the second type conductivity around said current path and extending from said base region into said second collector region, said gate region being connected to said base region for being at the same potential as said base region, and a third collector region of the first type conductivity disposed between said second



(PRIOR ART)

collector region and said base region and having a higher impurity concentration than that of said second collector region and forming junctions with each of said second collector region and said base region and said annular gate region projecting through said third collector region into said second collector region and being surrounded by said third collector region.

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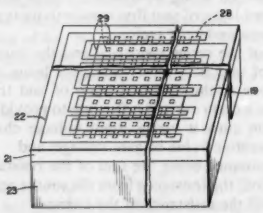
**4,337,475**

## HIGH POWER TRANSISTOR WITH HIGHLY DOPED BURIED BASE LAYER

**Choong-Ki Kim; Tae-Kyun Kwak, and Seong-Hyeon Choe, all of Seoul, Rep. of Korea, assignors to Gold Star Semiconductor, Ltd., Seoul, Rep. of Korea**

**Filed Jun. 15, 1979, Ser. No. 49,053**
**Int. Cl.³ H01L** *29/72, 29/06*
**U.S. Cl. 357—36** **1 Claim**




1. A semiconductor device comprising:

a collector substrate having a first type conductivity;

a base having a second type conductivity including a low resistivity first base zone adjacent to and partially buried within said collector substrate, a high resistivity second base zone adjacent to said collector substrate and adjacent to and covering said first base zone except for at least one first opening therein and at least one second opening therein, and a low resistivity third base zone adjacent to said second base zone and adjacent to said first base zone through said at least one first opening in said second base zone; and

an emitter having a first type conductivity adjacent to said second base zone and adjacent to said first base zone through said at least one second opening in said second base zone;

wherein:

said first base zone has a mesh shape including a plurality of first parallel strips and a plurality of second parallel strips perpendicular to said first parallel strips;

said third base zone has a comb shape, the teeth of said comb shape being disposed perpendicular to said first parallel strips of said first base zone;

said emitter has a comb shape, the teeth of said comb shape being disposed parallel to and aligned with said second parallel strips of said first base zone and interleaved with but not adjoining said teeth of said third base zone; and

said second base zone has a plurality of first openings disposed at the crossings of said first parallel strips of said first base zone and said teeth of said third base zone and has a plurality of second openings disposed between said second parallel strips of said first base zone and said teeth of said emitter.

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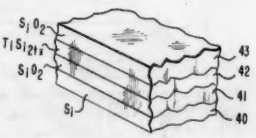
**4,337,476**

## SILICON RICH REFRACTORY SILICIDES AS GATE METAL

**David B. Fraser, Berkeley Heights, and Shyam P. Murarka, New Providenc, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.**

**Filed Aug. 18, 1980, Ser. No. 178,989**
**Int. Cl.³ H01L** *23/48*
**U.S. Cl. 357—67** **7 Claims**




1. An arrangement including a semiconductor chip comprising a single crystal semiconductor layer, a first electrically-insulating $SiO_2$ layer overlying said semiconductor layer, a first layer of electrically-conducting material overlying said $SiO_2$ layer, said electrically-conducting material comprising a silicon-rich silicide taken from a group of metals comprising titanium and tantalium and having an atomic ratio of the silicon to metal in the as-deposited film equal to or greater than 2 and less than or equal to 3, and a second layer of $SiO_2$ overlying said first layer.

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**4,337,477**

## COLOR DEMODULATING APPARATUS

**Takayuki Sagishima, Suita, and Teruo Kitani, Takatsuki, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan**

**Filed Apr. 11, 1980, Ser. No. 139,222**
**Claims priority, application Japan, Apr. 19, 1979, 54-48794; Aug. 10, 1979, 54-102422; Nov. 21, 1979, 54-151226**
**Int. Cl.³ H04N** *9/50*
**U.S. Cl. 358—18** **3 Claims**

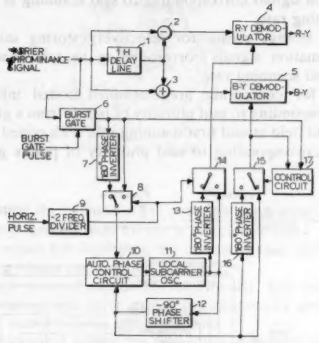
1. A color demodulating apparatus for alternatively switching between a burst signal and a signal with its phase inverted from said burst signal out of PAL type color television signals at each horizontal scanning period and for driving a local subcarrier oscillator using those alternatively switched signals; said apparatus comprising:

a first switching means and a first phase inverter operatively connected to an output of said local subcarrier oscillator, said first switching means connected to one input of one of a pair of color signal demodulators used to demodulate one of the color signals extracted from said television signals, wherein said first switching means alternatively feeds said output of said local subcarrier oscillator and a phase inverted version thereof from said first phase inverter to said one input of said one of said pair of color signal demodulators;

a 90° phase shifter operatively connected to said output of

said local subcarrier oscillator to produce a 90° phase shifted local subcarrier oscillator output signal;

a second switching means and a second phase inverter operatively connected to said 90° phase shifter and to one input of the other of said pair of color signal demodulators, said switching means alternatively feeding an output of said second phase inverter and said 90° phase shifted local subcarrier oscillator output to said one input of said other of said pair of color signal demodulators; and




a control circuit operatively connected to said second switching means to control said second switching means such that the polarity of the signal applied to said one input of the other demodulator by said second switching means matches the polarity of the other color signal extracted from the television signals applied to the other input of said other demodulator.

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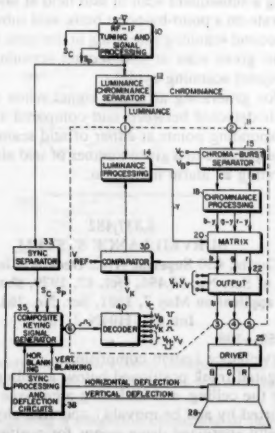
**4,337,478**

## COMPOSITE TIMING SIGNAL GENERATOR WITH PREDICTABLE OUTPUT LEVEL

**Wayne E. Harlan, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.**

**Filed Nov. 26, 1980, Ser. No. 210,840**
**Int. Cl.³ H04N 9/46**
**U.S. Cl. 358—20** **9 Claims**




**1. In a television receiver for processing a composite television signal including image and blanking intervals, said receiver including means for providing a plurality of image blanking signals each with a blanking pulse component occurring during image blanking intervals, said plurality of blanking signals including horizontal and vertical blanking signals; and keyed signal processing circuits; apparatus for generating a timing signal during said blanking intervals, said apparatus comprising:**

**resistive impedance voltage divider means coupled across a source of D.C. potential during said television signal image and blanking intervals and including an output terminal coupled to said keyed signal processing circuits, said voltage divider means being arranged with respect to said D.C. potential for producing a voltage divided version of said D.C. potential corresponding to a desired blanking voltage level;**

**controlled switching means coupled to said voltage divider means and operable between first and second conductive states; and**

**means for coupling said plurality of blanking signals to said switching means for (a) causing said switching means to exhibit said first conductive state for decoupling said coupling means from said voltage divider means in response to said blanking pulse components, so that said voltage divider means is then permitted to produce said desired blanking voltage level at said output terminal, and (b) causing said switching means to exhibit said second conductive state in the absence of said pulse components, so that a voltage level different than said desired blanking level is produced at said output terminal.**

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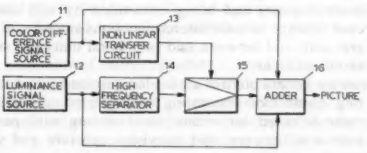
**4,337,479**

## COLOR RESOLUTION COMPENSATOR

**Tetsuo Tomimoto, Osaka; Yoshio Yasumoto, Higashiosaka, and Eiichi Taira, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan**

**Filed Sep. 5, 1980, Ser. No. 184,329**
**Claims priority, application Japan, Sep. 13, 1979, 54-118522; Sep. 14, 1979, 54-118476; Dec. 6, 1979, 54-158546**
**Int. Cl.³ H04N 9/535**
**U.S. Cl. 358—37** **12 Claims**




**1. A color resolution compensator for a color television receiver having a color difference signal source and a luminance signal source, said compensator comprising:**

**a non-linear transfer means, connected to said color difference source, for generating a gain control signal, said gain control signal bearing a monotonic non-linear relationship to a color difference signal generated by said color difference source;**

**a high frequency separator means, connected to said luminance signal source, for generating an output corresponding to a high frequency component of a luminance signal generated by said luminance signal source;**

**a controlled variable gain amplifier means, connected to said non-linear transfer means and said high frequency separator means, for generating a compensating signal, said gain control signal controlling the gain of said amplifier means and said output of said separator means being input to said amplifier means whereby said compensating signal corresponds to said separator means output amplitude modulated by said gain control signal;**

**and an adder means, connected to said amplifier means, color difference signal source and luminance signal source, for substantially adding the outputs thereof to generate an out-**

put signal for use by said color television receiver for picture reproductions.

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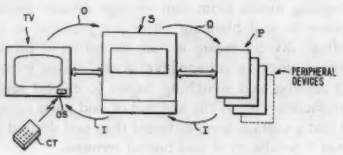
**4,337,480**

## DYNAMIC AUDIO-VIDEO INTERCONNECTION SYSTEM

**Lucien Bourassin, Saint-Cloud; Bernard Condat, Le Lion d'Anger; Jacques Fortin, Savigny-sur-Orge; Alain Leger, Juigne sur Loire; Joseph Soto, Montrouge, and Jean-Claude Solvinto, Nanterre, all of France, assignors to Syndicat des Constructeurs d'Appareils Radio Recepteurs et Televiseurs (SCART), Paris, France**

**Filed Feb. 8, 1980, Ser. No. 119,994**
**Claims priority, application France, Feb. 15, 1979, 79 03862**
**Int. Cl.³ H04N 5/22**
**U.S. Cl. 358—93** **20 Claims**




1. A dynamic audio-video interconnection system comprising:

a television receiver;

a peripheral-television multipin connector coupled to said television receiver;

a plurality of peripheral units for receiving or transmitting video/audio signals;

a plurality of control stages, each of said control stages being associated with a different one of said peripheral units for coupling said associated peripheral unit to said peripheral-television multipin connector;

a plurality of electronic switches, each of said electronic switches being associated with a different one of said control stages and being controlled by said associated control stage to make interconnections among said peripheral units and between said peripheral units and said television receiver;

a remote system control means for generating and transmitting commands requesting said electronic switches to make selected interconnections among said peripheral units and between said television receiver and selected peripheral units;

means in said television receiver for receiving said transmitted commands and for transmitting said received commands to said control stages; and

a microprocessor coupled to said receiving and transmitting means and each of said control stages for receiving said commands from said receiving and transmitting means and for controlling said electronic switches to make said requested interconnections.

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**4,337,481**

## MOTION AND INTRUSION DETECTING SYSTEM

**Peter Mick, and Donald Beck, both of 18 Wood Glen Way, R.D. 1, Boonton, N.J. 07005**

**Filed Jun. 10, 1980, Ser. No. 158,215**
**Int. Cl.³ H04N 7/18**
**U.S. Cl. 358—105** **55 Claims**

1. A motion detection system comprising:

means for scanning a given field of view and for generating scan signals corresponding to the content of said field of view;

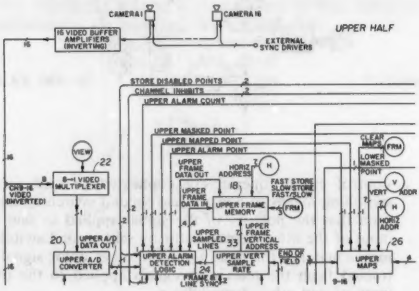
said scanning means including means for scanning said given field at a first predetermined scanning rate and for subsequently scanning said field at a second predetermined scanning rate which is different from said first scanning rate, at least one of each of said first and second predetermined scanning rate scans comprising a scanning cycle;

means responsive to said scan signals at each scanning rate for converting said scan signals into a plurality of coded digital signals which correspond to a predetermined characteristic of said field content at a plurality of points in said field;

first storage means for selectively storing said coded information signals corresponding to said scanning at said first scanning rate;

second storage means for selectively storing said coded information signals corresponding to said scanning at second scanning rate;

means for comparing predetermined coded information corresponding to said plurality of points from a given scan of said field at said first scanning rate with coded information corresponding to said plurality of points generated




during a subsequent scan of said field at said first scanning rate on a point-by-point basis, said subsequent scan at said first scanning rate being in the same scanning cycle as said given scan at said first scanning rate or in a subsequent scanning cycle;

means for comparing predetermined coded information corresponding to said plurality of points from a given scan of said field at said second scanning rate with coded information corresponding to said plurality of points generated during a subsequent scan of said field at said second scanning rate on a point-by-point basis, said subsequent scan at said second scanning rate being in the same scanning cycle as said given scan at said second scanning rate or in a subsequent scanning cycle;

means for generating an alarm signal when a given difference is detected between said compared signals for said corresponding points at either of said scanning rates; and

means responsive to a given number of said alarm signals for generating an alarm indication.

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**4,337,482**

## SURVEILLANCE SYSTEM

**John M. Coutta, 450 Superior Ave., Decatur, Ga. 30030**

**Division of Ser. No. 85,496, Oct. 17, 1979, abandoned. This application May 7, 1981, Ser. No. 261,609**
**Int. Cl.³ H04N 7/18**
**U.S. Cl. 358—108** **7 Claims**

1. A surveillance system comprising:

an elongated track positioned below a ceiling along a path under the ceiling, and including a carriage adapted to be supported by and be movably operated along said track;

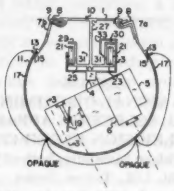
electrically energized drive means for positioning said carriage along said track;

a television camera supported by said carriage below the ceiling;

a mirror supported by said carriage and positioned in front of said camera and electrically responsive mirror adjust-

ment means for adjusting said mirror about two perpendicular axes, each being perpendicular to the axis of view of said camera, whereby the effective view seen by the camera may be varied horizontally and tilted;

a cover extending from end to end of said track and downward from, on both sides of, and under said track, and said cover being generally opaque along one side and being approximately 25% to 60% light transmissive over a




portion of the balance of the cover through which camera viewing through said mirror is effected;

display means for displaying the output of said camera; and

operating means comprising:

carriage control means for electrically and selectively operating said drive means for electrically positioning said camera along said track, and

mirror control means for providing electrical signals to and selectively operating said mirror adjustment means.

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**4,337,483**

## TEXT VIDEO-TRANSMISSION SYSTEM PROVIDED WITH MEANS FOR CONTROLLING ACCESS TO THE INFORMATION

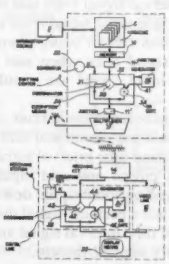
**Louis C. Guillou, Bourgbarre-Saint Erblon, France, assignor to Etablissement Public de Diffusion dit "Telediffusion de France", Montrouge and L'Etat Francais, represente par le Secretaire d'Etat aux Poste et Telecommunications (Centre National d'Etudes des Telecommunications), Issy les Moulineaux, both of, France**

**Filed Jan. 31, 1980, Ser. No. 117,234**

**Claims priority, application France, Feb. 6, 1979, 79 02994**

**Int. Cl.**[3] **H04N** *7/16;* **H04K** *1/00*

**U.S. Cl. 358—114** **11 Claims**



**1**. A text video-transmission system comprising an information emitting center and receiving stations, the emitting center comprising:

means for composing a magazine consisting of pages organized into lines of characters, if such means are not already contained in the information source,

a circuit for memorizing the magazine in the form of numerical signals grouped in octets (8 binary elements), these octets comprising control octets and data octets, the control octets indicating in particular the beginnings and ends of pages and the beginnings and ends of lines, the data octets corresponding to characters contained in each line, all these control and data octets comprising a binary element of high weight which is an odd-numbered element, the octets wherein the 6th and 7th binary elements are zero being the control octets,

a junction connected to the circuit, and

a distribution multiplexer serving to insert the information in the lines of a television signal, this emitting center further comprising encryption means for encoding the information using an operating key, each receiving station comprising:

a circuit for receiving and demodulating said television signal,

a line for processing the video picture signals,

a line for processing the numerical signals, containing in particular a numerical signal decoder, and

display means,

each receiving station further comprising decryption means for decoding the encrypted information and using said operating key, wherein, in this system:

(A) the encryption means of the emitting center comprise:

(a) a generator **22** delivering a numerical signal representing an operating key K, this key changing randomly at predetermined intervals,

(b) automatic encryption means **24** comprising:

(i) a discriminator with an input connected to the magazine memorizing circuit from which it receives clear octets, this discriminator being capable of distinguishing, among these clear octets, those wherein the 7th and 6th binary elements are zero, this discriminator having two outputs, the first carrying these octets wherein the 7th and 6th binary elements are zero and connected to the distribution multiplexer via the junction, and the second carrying the clear octets $d_j$ wherein the 7th and/or 6th binary elements are not zero,

(ii) an OR-exclusive logic circuit with two inputs, one of which is connected to the second output of the discriminator from which it receives the clear octets $d_j$ wherein the 6th and/or 7th binary elements are not zero, this logic circuit having an output which carries odd-numbered encrypted octets $D_j$, the encrypted octets then being directed toward the distribution multiplexer via the junction;

(c) a generator of encoding octets controlled by the automatic encryption means from which it receives octets indicating the page and line numbers of the data to be transmitted and the signal corresponding to the operating key, this octet generator delivering, for each data octet $d_j$ of a displayable line, an encoding octet $C_j$, this octet having an even-numbered 8th binary element and having 7th and 6th binary elements of zero, this octet being applied to the other input of the logic circuit,

(B) the decryption means of each receiving station comprise:

(d) a generator of a numerical signal representing the operating key K in use in the emitting center,

(e) an automatic decryption means comprising:

(i) a discriminator with an input connected to the numerical signal decoder of the receiving station from which it receives the coded octets, this discriminator being adapted to distinguish, among these coded octets, those wherein the 7th and 6th binary elements are zero, this discriminator having two outputs, the first carrying these octets wherein the 7th and 6th binary elements are zero, this first output being directly connected to the display means, the second carrying the coded octets $D_j$ wherein the 7th and/or 6th binary elements are not zero,

(ii) an OR-exclusive logic circuit with two inputs, one connected to the second output of the discriminator from which it receives the encrypted octets $D_j$, this logic circuit having an output which carries decrypted octets $d_j$ which are then directed towards the display means;

(f) a generator of decoding octets controlled by the automatic decryption means which transmits to it the octets indicating the page and line numbers of the data transmitted and the signal corresponding to the operating key K in use, this generator of decoding octets having an output which delivers, for each coded octet received, a decoding octet $C_J$ having a heavy weight binary element which is forced to zero and 7th and 6th binary elements of zero.

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**4,337,484**

## APPARATUS FOR THE TRANSCRIPTION OF A VIDEO DISK ONTO A CENEFILM

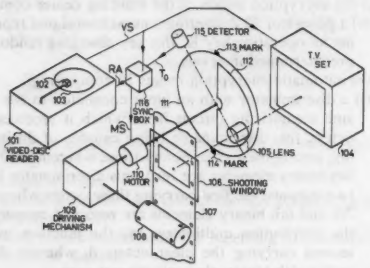
**Georges Broussaud, and Claude Tinet, both of Paris, France, assignors to Thomson-CSF, Paris, France**

**Filed Oct. 5, 1979, Ser. No. 82,321**

**Claims priority, application France, Oct. 11, 1978, 78 28984**

**Int. Cl.³ H04N *5/76, 5/88***

**U.S. Cl. 358—128.6** **5 Claims**




1. An apparatus for the transcription of frames divided into fields from a video disk onto a cinefilm, said apparatus comprising a videodisk reader for reading successive fields on said disk, a television set and a camera, wherein the camera has a shutter and a lens, means responsive to control signals for driving said shutter to mask and unmask the lens for durations equal to at least that of the reading of one field, each masking being followed by an unmasking thereof for a period equal to that of the reading of one frame and circuit means connected to said reader for producing control signals to cause advance of the film when the lens is masked, and to cause periodic rereading of at least two fields by the reader to correlate the television and cinematic standards of frames per second.

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**4,337,485**

## BROADCAST TELETEXT SYSTEM

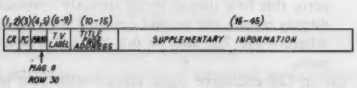
**John P. Chambers, Copthorne, England, assignor to British Broadcasting Corporation, London, England**

**Filed Sep. 24, 1980, Ser. No. 190,470**

**Claims priority, application United Kingdom, Oct. 31, 1979, 7937687**

**Int. Cl.³ H04N *7/00***

**U.S. Cl. 358—147** **3 Claims**




1. In a method of broadcast teletext transmission wherein information is transmitted as pages, comprising the steps of

transmitting, for each page, a plurality of rows of information forming a set of rows intended for display, at least one of said rows containing a digitally coded page address; and

further transmitting, for at least some pages, an additional row of information outside said set of rows and not intended for display, said additional row containing one or more codes pointing to another page address.

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**4,337,486**

## SYNCHRONIZING SIGNAL DISCRIMINATOR FOR USE IN CHANNEL SELECTION APPARATUS OF TELEVISION RECEIVER

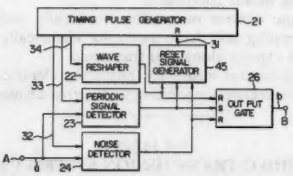
**Eisaku Akutsu, and Shigeo Matsuura, both of Yokohama, Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Filed Dec. 2, 1980, Ser. No. 212,256**

**Claims priority, application Japan, Dec. 3, 1979, 54-155625**

**Int. Cl.³ H04N *5/08***

**U.S. Cl. 358—155** **8 Claims**




1. A synchronizing signal discrimination circuit for use in a channel selection apparatus having a preset function of a television receiver, comprising;

(a) a timing pulse generation circuit for generating a first time interval signal having a first predetermined pulse width after a reset signal has been applied thereto and a second time interval signal having a second predetermined pulse width after the expiration of said first time interval signal,

(b) an input terminal for receiving an input signal,

(c) a noise detection circuit connected to said timing pulse generation circuit and said input terminal for receiving said first time interval signal from said timing pulse generation circuit and said input signal from said input terminal, said noise detection circuit being operable to produce a noise detection signal only when said first time interval signal and said input signal are simultaneously applied thereto,

(d) a periodic signal detection circuit connected to said timing pulse generation circuit and said input terminal for receiving said second time interval signal from said timing pulse generation circuit and said input signal from said input terminal, said periodic signal detection circuit being operable to produce a periodic signal detection signal only when said second time interval signal and said input signal are simultaneously applied thereto,

(e) a reset signal generation circuit connected to said noise detection circuit and said periodic signal detection circuit for producing a reset signal when either said noise detection signal or said periodic signal detection signal is applied thereto, said reset signal being supplied to said timing pulse generation circuit, and

(f) a first output gate circuit connected to said noise detection circuit and said periodic signal detection circuit, said first output gate circuit being reset when said noise detection signal from said noise detection circuit is applied thereto and set when said periodic signal detection signal from said periodic signal detection circuit is applied thereto to produce a first output signal.

4,337,487

## MAGNETIC RECORDING/REPRODUCING APPARATUS

Kazuki Takai, Toda, Japan, assignor to Clarion Co., Ltd., Japan

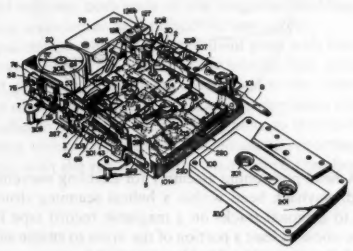
Filed Mar. 21, 1980, Ser. No. 132,658

Claims priority, application Japan, Mar. 23, 1979, 54-036892[U]; Mar. 27, 1979, 54-038830[U]

Int. Cl.³ G11B *15/18, 17/00*

U.S. Cl. 360—71 6 Claims

1. An auto-eject mechanism for a magnetic recording/reproducing apparatus which comprises; a tape pack receiving frame; a support structure for said frame which structure supports said frame for movement between a tape pack receiving or ejecting position to a recording/reproducing position within said apparatus, said support structure including rack carrying means interlocked with said frame and movable therewith as said frame is moved from said tape pack receiving position to said recording/reproducing position, first rack means on said rack carrying means, and support means having gear means mounted thereon normally out of engagement with



said rack means; motor means for driving said gear means; means for generating a signal at the end of a tape in said tape pack; and electromagnetic means operated by said signal to move said support means to bring said gear means in meshing engagement with said rack means, said gear means being driven by said motor means to drive said rack carrying means in a direction which moves said frame and tape pack carried thereby into said tape pack ejecting position.

4,337,488

## MOTOR CONTROL DEVICE FOR A TAPE RECORDER

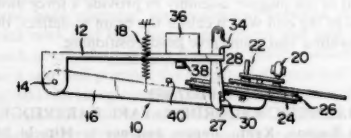
Akira Osanai, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Nov. 16, 1979, Ser. No. 95,076

Claims priority, application Japan, Nov. 16, 1978, 53/141617

Int. Cl.³ G11B *15/26*

U.S. Cl. 360—90 2 Claims




1. In combination of a tape recorder;
a drive motor having an output shaft;
a driven member including a capstan shaft having a flywheel thereon;
a motor pulley mounted on said output shaft and adapted to abut on said flywheel for transmitting driving force thereto;
a magnetically sensitive element arranged adjacent to said motor pulley, said motor pulley being a magnet having S and N poles alternatively arranged thereon; and
said pulley and magnetically sensitive element being operatively connected to said motor and forming a control pulse generator for said motor.

4,337,489

## DEVICE FOR THE PROGRAMMED CONTROL OF OPERATIVE SEQUENCES, IN PARTICULAR FOR CASSETTE-TYPE TAPE RECORDERS

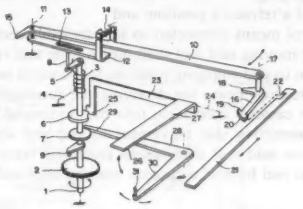
Rodolfo Cicatelli, Gandria, Switzerland, assignor to Autovox S.p.A., Rome, Italy

Filed Apr. 30, 1979, Ser. No. 34,213

Claims priority, application Italy, May 5, 1978, 49214 A/78

Int. Cl.³ G11B *15/26, 23/04*

U.S. Cl. 360—96.5 13 Claims



1. Device for the programmed control of the operative sequences for a cassette-type tape recorder having a tape transport mechanism moved by a motor and a support for the magnetic heads and for the pressure roller, which device comprises: a shaft which can be rotatably moved in a predetermined direction by a wheelwork connected to said motor; a spring which tends to cause the rotation of said shaft in the opposite direction; first, second, third and fourth control means disposed on and rotatable with said shaft; means of introduction and ejection of the cassette into and out of said tape recorder sensible to said first control means; means for lowering and for raising the cassette in said tape player sensible to said second control means; approach and removal means to and from the cassette of the support for the magnetic heads and the pressure roller, sensible to said third control means; engagement and disengagement means for the wheelwork, sensible to said fourth control means, and means for selectively rotating said shaft in said predetermined direction by said motor causing a predetermined sequence of operations controlled by said first, second, third, and fourth control means, and for selectively rotating said shaft in the opposite direction by said spring to cause the opposite sequence of operations.

4,337,490

## CASSETTE TAPE PLAYER

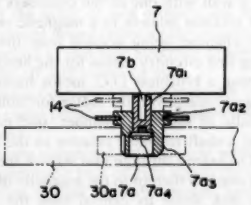
Teturo Kamimura; Masahiro Komatsubara; Shizuo Ando, and Takugi Inanaga, all of Kawagoe, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed May 15, 1980, Ser. No. 149,944

Claims priority, application Japan, May 22, 1979, 54-62908; May 22, 1979, 54-62909

Int. Cl.³ G11B *15/60*

U.S. Cl. 360—96.6 8 Claims




1. A cassette tape player comprising
a chassis having a main surface,

reel drive means mounted on said chassis,

a receptacle for receiving a cassette therein, movably mounted on the chassis at an oblique position with respect to the chassis main surface,

guide means for first translating the receptacle in the oblique position, and then turning the receptacle about its trailing edge to place the receptacle in a position parallel to the main surface, and

movable reel shaft means connected to said reel drive means, said reel shaft means having an engaging position for engaging the reels of a cassette inserted in said tape player and a retracted position; and

control means connected to said movable reel shaft means for moving said reel shaft means from said retracted position to said engaging position, said control means includes detecting means for detecting the turning movement of the cassette receptacle into the horizontal position and transmitting said movement to said reel shaft means to move said reel shaft means from said retracted position into reel hubs of a cassette inserted into said tape player.

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**4,337,491**

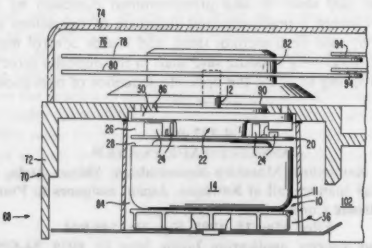
## BRUSHLESS D.C. MOTOR ASSEMBLY

**Alfred Hasler, Mountain View, Calif., and Bernhard Schuh, Simsbury, Conn., assignors to International Memories, Inc., Cupertino, Calif. and Papst-Motoren KG, Schwarzwald, Fed. Rep. of Germany**

**Continuation of Ser. No. 957,769, Nov. 3, 1978, abandoned. This application May 29, 1980, Ser. No. 154,542**

**Int. Cl.³ G11B *25/04***

**U.S. Cl. 360—97** **8 Claims**



1. In a magnetic disk recording assembly of the type having a casing provided with a pair of adjacent air flow chambers separated by a wall with one of the chambers having a magnetic disk for rotation relative to a magnetic read-write head and the other chamber being isolated from the first chamber and containing first circuitry means for the head, the improvement comprising a brushless D.C. motor having an external housing; means coupled with the motor for mounting it on the casing externally of said one chamber, said motor having a fixed part and a shaft rotatable relative to the fixed part, the shaft adapted to extend through said wall of the casing and to be coupled at one end thereof to the magnetic disk for rotating the magnetic disk about its central axis, the motor having second circuitry means for controlling the excitation of the motor, and an annular support member carried by the fixed part in surrounding relationship to the shaft of the motor, said second circuitry means being mounted on the support member.

**4,337,492**

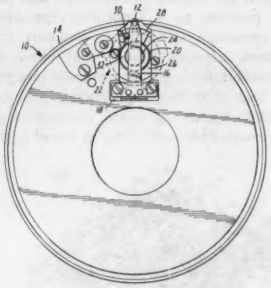
## HEAD POSITIONING TRANSDUCER FOR HELICAL SCAN VIDEO REPRODUCER

**Marshall R. Brookhart, Thousand Oaks; Fredrick J. Hodge, and Thomas J. Worden, both of Camarillo, all of Calif., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.**

**Filed Apr. 8, 1980, Ser. No. 138,361**

**Int. Cl.³ G11B *5/52, 21/10***

**U.S. Cl. 360—109** **9 Claims**



1. A head positioning assembly for enabling movement of a record/playback head within a helical scanning drum transverse to diagonal tracks on a magnetic record tape helically wound about at least a portion of the drum to enable automatic track following, said assembly comprising:

(a) a cantilevered deflectable non-ferromagnetic beam member supported at one end within said drum and extending radially outward toward the periphery of said drum and having said head secured to the radially extended extremity thereof,

(b) a drive coil secured to said beam at a position between said radial extremity and the cantilevered support thereof, said coil being of homogeneous construction without internal supports and of low mass to enable said coil to withstand appreciable forces transverse to the axis thereof, and

(c) a permanent magnet field providing assembly mounted on the drum and including a gap across which a magnetic field extends, positioned relative to the drive coil such that at a center nominal position of said beam the coil is centered within the gap, whereby current applied to said coil creates an electromagnetic field which interacts with the field of the magnet assembly to provide a force along the axis of the coil which causes the beam to deflect, thereby providing said transverse head positioning.

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**4,337,493**

## MAGNETIC RECORDING TAPE CARTRIDGE

**Shinichi Kagano, Kyoto, Japan, assignor to Hitachi Maxell, Ltd., Osaka, Japan**

**Continuation of Ser. No. 50,210, Jun. 20, 1979, abandoned. This application Jun. 15, 1981, Ser. No. 273,412**

**Claims priority, application Japan, Jun. 20, 1978, 53/85995[U]**

**Int. Cl.³ G11B *23/04***

**U.S. Cl. 360—130.33** **3 Claims**

1. A magnetic recording tape cartridge comprising in combination:

(a) a bottom section and a top section assembled together by a fastening means so as to provide a cartridge case having a front wall and a tape chamber with a plurality of openings formed in said front wall, one opening of which accommodates a magnetic recording tape head of a tape player,

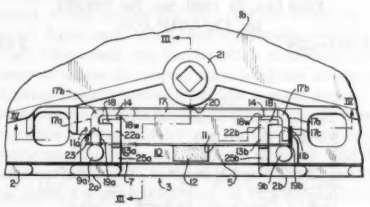
(b) a pair of reels accommodated in said tape chamber, rotatably mounted relative to respective drive shaft insertion holes defined in said cartridge case,

(c) a magnetic recording tape wound around said pair of reels, the intermediate portion of said recording tape being stretched between said reels running along a predetermined path defined by said plurality of openings formed in said front wall,

(d) a pair of tape guide pins protruding from the bottom section of said cartridge case positioned adjacent to both sides of said recording tape head opening, each guide pin having a base piece projecting backward from said respective guide pin,

(e) a magnetic shielding plate disposed in the inner part of the said tape chamber having a generally elongated portion with both ends thereof bent perpendicular to said elongated portion, said elongated portion extending parallel with said tape path so as to face said recording tape head opening, both ends of said magnetic shielding plate being mounted on said respective base pieces,

(f) a pad device composed of a resilient plate with both ends thereof bent perpendicular to the intermediate portion of said plate and a cushioning block fixed to the center portion of the resilient plate, said pad device being disposed parallel to said magnetic shielding plate so that said cushioning block is opposed to the magnetic recording tape head, with the recording tape sandwiched therebetween,



upon the insertion of said recording head through the recording tape head opening, said pad device being mounted at the ends thereof on the respective corresponding base pieces,

(g) a pair of stepped ribs provided at least on the bottom section of said cartridge case at both sides of the recording tape head opening, juxtapositioned between said guide pins with said base piece projections and said opening, each of said ribs having a front half portion which steps up to a rear half portion, the height of the rear half portions of said ribs being equal to or slightly lower than the height of said base pieces, and the height of the front half portions of said ribs being lower than the upper surface of said rear half portions such that the upper surface of said front half portions contact the lower edge of said magnetic recording tape, the upper surface of said rear half portions acting to support the resilient plate of said pad device when the pad device is displaced downwardly from a normal position,

(h) a pair of lateral protrusions provided on the bottom section of said cartridge case, being disposed at the rear of the stepped ribs for engaging the bent ends of said magnetic shielding plate and the front face of the lower portion of said magnetic shielding plate closely contacting the vertical rear end surface of said ribs so as to correctly and securely position said magnetic shielding plate, whereby the ribs thus insure positive seating of the resilient plate and preclude inadvertent misplacement thereof.

**4,337,494**

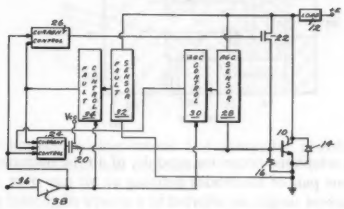
## AUTOMATIC BIAS-CONTROLLED VMOS/BIPOLAR DUAL-TRIGGERED SWITCH

**Richard B. Huykman, Lincoln Park, N.J., assignor to Reliance Electric Company, Cleveland, Ohio**

**Filed Apr. 7, 1980, Ser. No. 137,564**

**Int. Cl.³ H02H *3/08***

**U.S. Cl. 361—86** **26 Claims**



**1**. An automatic bias-controlled switch comprising:

bipolar power switching transistor means having a collector electrode connected to a high-power operating voltage source, an emitter electrode connected to a source of reference potential, and a base electrode for receiving a base control current;

an input terminal for receiving a switch control signal;

a programmable base current supply connected between said input terminal and said base electrode of said bipolar power transistor means, said base current supply comprising primary base current control means responsive to said switch control signal for supplying primary current of sufficient magnitude to said base electrode for turning on said transistor means at least into an unsaturated conduction state when said switch control signal is at a first level, and secondary base current control means responsive to said switch control signal for supplying a secondary current to said base electrode of said transistor means a predetermined time after said primary current is supplied thereto to further drive said transistor means toward saturation and for minimizing power dissipation of transistor means, one of said primary and secondary current control means being responsive to a second level of said switch control signal for initially reducing the magnitude of current supplied to said base electrode a sufficient amount to insure said transistor means being placed in an unsaturated conduction state, and a predetermined time thereafter the other of said primary and secondary base current control means reducing the magnitude of current being supplied to said base electrode to substantially zero for turning off said transistor means;

a sensing means connected to said transistor means for generating a signal proportional to the base-collector voltage thereof; and

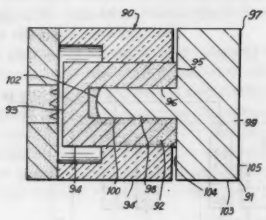
feedback means connected between said sensing means and said programmable base current supply for controlling the base current to said transistor means, said base current being in proportion to said generated base-collector voltage proportional signal wherein said feedback means increases the base current when said base-collector voltage increases and decreases said base current when said base-collector voltage decreases.

4,337,495

## CARBON ELECTRODE HAVING METALLIC HEAT SINK

William V. Carney, Oyster Bay, and Loren A. Singer, Jr., Mamaroneck, both of N.Y., assignors to Porta Systems Corp., Syosset, N.Y.

Filed Jun. 13, 1980, Ser. No. 177,812
Int. Cl.[3] H02H 3/22
U.S. Cl. 361—119 1 Claim




1. In a telephone protector module, of a type incorporating at least one pair of electrodes defining an air gap over which excess current surges are shorted to a source of ground potential, at least one of said electrodes being of a composite construction including a first portion of particulate carbon defining an operative surface facing a corresponding surface on the other of said electrodes, and a second portion bonded thereto of a conductive material having a specific heat substantially greater than that of said first portion, said second portion serving as a heat sink during the transmission of sustained excess current surges, the improvement comprising: said first portion being in the form of a hollow elongated cylinder having a blind bore extending from one end thereof, said bore including a cylindrical surface and an end surface; said second portion having a base of diameter greater than that of said first portion, and having a centrally disposed axially extending shank of diameter corresponding to that of said bore; said shank being disposed within said bore and bonded thereto substantially the entire length of said shank; whereby a substantial area of mutual contact is obtained to facilitate the transfer of heat from said first portion to said second portion during arcing.

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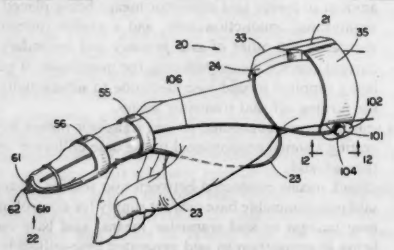
4,337,496

## SELF-DEFENSE APPARATUS

Gerald Laird, Indianapolis, Ind., assignor to Ultradyne, Inc., Norristown, Pa.

Continuation-in-part of Ser. No. 932,539, Aug. 10, 1978, Pat. No. 4,242,715. This application Apr. 10, 1980, Ser. No. 139,128
The portion of the term of this patent subsequent to Dec. 30, 1997, has been disclaimed.
Int. Cl.[3] F41B 15/04
U.S. Cl. 361—232 9 Claims




1. A self-defense apparatus to be worn by the user which comprises:

a glove member including a wrist strap for securement about the wrist of the user and a pouch;

a source of high voltage housed in a portable module and suitably adapted to be retained in said pouch; and

a finger probe sleeve comprising a portion of said glove member and being electrically coupled to said source of high voltage and suitably arranged to slide over and be worn on a finger of the hand wearing said glove member, said finger probe sleeve including two electrically conductive, outwardly protruding, pointed prongs and a layer of electrical insulating material disposed between said finger and said two prongs.

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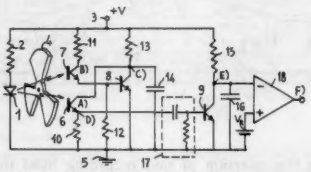
4,337,497

## DEVICE FOR DETECTING THE DIRECTION AND CHANGE OF ROTATIONAL SPEED OF A ROTATING ELEMENT

Gianbattista Dalle Carbonare, Pavia, Italy, assignor to Honeywell Information Systems Inc., Waltham, Mass.

Filed Oct. 23, 1980, Ser. No. 199,883
Int. Cl.[3] G01P 3/36
U.S. Cl. 361—239 3 Claims




1. A device for detecting the direction and speed of rotation of a rotating element including:

first circuit means for generating a first pulsed signal having a frequency related to the rotation speed of said element;

second circuit means receiving in input said first pulsed signal for producing a second sawtooth pulsed signal with frequency equal to the one of said first signal;

third circuit means responsive to said second signal and to the rotation of said element for generating a third pulsed signal having frequency equal to the one of said first signal, said third pulsed signal having a phase angle relative to said first signal dependent on the direction of the rotation movement of said element, said third pulsed signal having a variable pulse width dependent both on the frequency and the phase angle;

fourth circuit means responsive to said third pulsed signal to produce a fourth electrical signal, the fourth electrical signal having the form of sawtoothed pulses with its frequency equal to the frequency of said first signal, when the pulse width of said third signal is longer than a predetermined value, in form of a voltage rising ramp, for a width of said third signal lower than a predetermined value; and

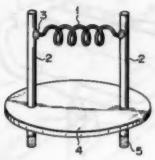
fifth circuit means responsive to said fourth signal to supply an informatin signal when the pulse width of said fourth signal exceeds a predetermined threshold value.

4,337,498

## SMALL IGNITION DEVICE COMPRISING STRING-LIKE SILICON CARBIDE HEATING ELEMENT AFFIXED TO TERMINAL SUPPORTS

Masayosi Takahasi, Kasugai; Sadatosi Nakazono, Nagoya, and Yoshio Nakamura, Sagamihara, all of Japan, assignors to Tokai Konetsu Kogyo Co., Ltd., Tokyo, Japan

Division of Ser. No. 5,030, Jan. 22, 1979, abandoned. This application Sep. 5, 1980, Ser. No. 184,421
Claims priority, application Japan, Jan. 27, 1978, 53/8105
Int. Cl.³ F23Q 7/00
U.S. Cl. 361—266 6 Claims



1. A small ignition device, comprising

a pair of electrically conductive silicon carbide rod-like terminals, and

a string-like silicon carbide heating element extending between and having respective ends joined and electrically connected by fused electrically conductive silicon to a respective rod-like terminal for supporting said string-like element, and

support means supporting said rod-like terminals spaced apart from each other, and electrically insulated from each other, said rod-like terminals extending from said support means to support said string-like silicon carbide heating element spaced from said support means,

said string-like element having all cross-sectional dimensions between 0.5 mm and 2.0 mm and having a resistivity of between 0.01Ω·cm and 10Ω·cm whereby said heating element is heated to between about 1000° C. and 1300° C. in about 1 to 4 seconds after an electric current is connected thereto.

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4,337,499

## ELECTRONIC ENCLOSURE AND ARTICULATED BACK PANEL FOR USE THEREIN

Michael J. Cronin, Sherman Oaks, and David K. Elliot, Burbank, both of Calif., assignors to Lockheed Corporation, Burbank, Calif.

Filed Nov. 3, 1980, Ser. No. 203,254
Int. Cl.³ H05K 7/20
U.S. Cl. 361—386 15 Claims

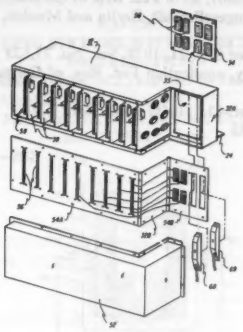
1. Programmable electronic enclosure comprising:

a three dimensional enclosure having a front panel and a removable back panel disposed in at least two planes generally parallel to each other and to the front panel;

a first portion of said back panel in a first one of said at least two planes including a plurality of terminals each adapted on the front side thereof for electrical connection to circuit boards inserted into the enclosure through the front panel, each of the plurality of terminals being adapted to be wired on the back side thereof by automatic wiring means;

a second portion of said back panel in a second one of said at least two planes including a connector adapted to be wired on the back side thereof by automatic wiring means;

said two portions of said back panel being pivotably connected to opposite ends of a side panel of the enclosure whereby both of the portions of said back panel and the pivotably connected side panel may be disposed in a single plane when removed from the enclosure to facilitate wiring of said plurality of terminals to said connector by



automatic wiring means and thereafter articulated for attachment to said enclosure.

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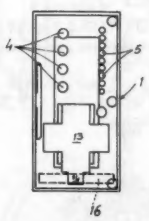
4,337,500

## PHYSICAL-VARIABLE MEASURING, ADJUSTING AND DISPLAYING INSTRUMENT

Pietro Zanazzo, Via Crespi, 55, 28100-Novara; Giuliano Mainardi, Corso Alpi, 14, Bellusco - Milano, and Rodolfo Giorgetti, Via Milite Ignoto, 20, Seveso - Milano, all of Italy

Filed Jul. 21, 1980, Ser. No. 170,531
Claims priority, application Italy, Mar. 14, 1980, 20676 A/80
Int. Cl.³ H05K 1/14
U.S. Cl. 361—395 3 Claims



1. A measuring, adjusting and displaying device, comprising a front panel and a parallel spaced printed circuit board pair, effective to be inserted into a box, characterized in that said frontal panel comprises supporting and guiding means supporting and guiding said printed circuit boards, and, through openings in said front panel effective to receive controlling and displaying circuits, said two printed circuit boards being perpendicular to said front panel and being provided with controlling and displaying elements fixed to said boards on the front end portions thereof, said elements extending parallel to said boards and fixed to said boards by leads having a 90° bend therein, said controlling and displaying elements extending into said through openings, the elements thereby being visible and accessible by an operator from the front of the device, said printed circuit board supporting and guiding means consisting of slots formed on two pairs of arms rigid with said front panel and projecting substantially perpendicularly therefrom at the rear portion thereof, a pair of arms being located at the top and a pair at the bottom, said slots receiving therebetween the upper and lower edges of said boards.

4,337,501

## ELECTROCHEMICAL CAPACITOR

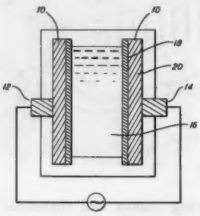
Konrad Mund; Gerhard Richter, both of Erlangen, and Erhard Weidlich, Spardorf, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Sep. 21, 1979, Ser. No. 77,623

Claims priority, application Fed. Rep. of Germany, Sep. 28, 1978, 2842352

Int. Cl.[3] H01G 9/00; B01J 17/00

U.S. Cl. 361—433 1 Claim



1. An electrochemical capacitor comprised of at least one pair of electrodes, said electrodes consisting of glass carbon which has been activated by contact with concentrated sulfuric acid at a temperature of up to about 330° C.

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4,337,502

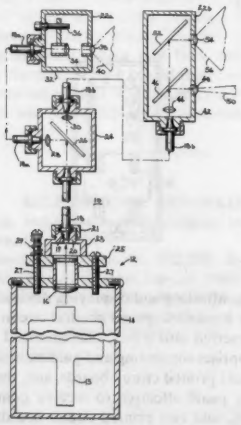
## LIGHT BEAM PRODUCING DEVICE

Charles Lescrenier, 660 Crescent Ct., Wauwatosa, Wis. 53213

Filed Jun. 2, 1980, Ser. No. 155,052

Int. Cl.[3] F21V 7/04

U.S. Cl. 362—32 18 Claims



1. An object orienting device for producing at least one beam of light having a desired configuration and forming a reference datum for the object at an orientation location, said device comprising:

a source of light positioned at one location;

means for concentrating the light from said source;

elongated, solid light transmitting means for receiving and transmitting the concentrated light to the orientation location that is remote from said first location; and

lens means positioned at the orientation location for receiving the light from said transmitting means, said lens means forming the light into a beam of the desired configuration and projecting same as a reference datum at the orientation location.

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4,337,503

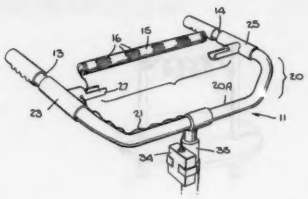
## HANDLEBAR MOUNTED DETACHABLE BICYCLE LIGHT FIXTURE

Samuel Turner, 525 Atlanta Ave., Massapequa, N.Y. 11758

Continuation-in-part of Ser. No. 108,420, Dec. 31, 1979. This application Dec. 15, 1980, Ser. No. 216,670

Int. Cl.[3] F21V 33/00

U.S. Cl. 362—72 12 Claims



1. A bicycle illumination device adapted for use on a bicycle handlebar comprising:

(a) illumination means, said means positioned between the side portions of a handlebar;

(b) a pair of resilient handlebar mounts engaging the handlebar, each mount having a support surface extending from the mount and being in alignment with one another for placement of the illumination means perpendicular to the forward movement of the bicycle, said illumination means being attached to the support surface, and

(c) means for energizing the illumination means.

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4,337,504

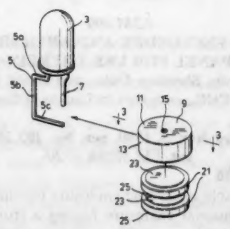
## ELECTRONIC EARRING

Colin V. M. Simpson, 175 Trudelle St., Unit 8, Scarborough, Ontario, Canada M1J 3K5

Filed Aug. 25, 1980, Ser. No. 180,958

Int. Cl.[3] F21L 15/18

U.S. Cl. 362—104 12 Claims



1. An electronic earring for use on a pierced earlobe, said earring forming an electrical circuit comprising a portable electrical power supply at one side of the circuit, load means at another side of the circuit away from said power supply and first and second electrical leads between and spacing said load means and power supply, said load means, said power supply and said electrical leads cooperating with one another to provide an ear clip arrangement with said power supply forming a first clip portion for clipping immediately behind the earlobe, said load means forming a second clip portion for clipping forwardly of the earlobe, said first lead forming a first connector between said clip portions for projecting through the pierced earlobe and said second lead forming a second connection between said clip portions for wrapping around the earlobe, said power supply and said load means being movable to

and from a securing position relative to one another to allow opening and closing of said clip arrangement on the earlobe.

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**4,337,505**

## HOLDER FOR LIGHT-TRANSMISSIVE PICTURES

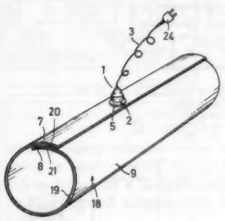
**Ernest Heimo, Chemin de beau Rivage 10, 1000 Lausanne, Switzerland**

**Filed Jan. 29, 1980, Ser. No. 116,643**

**Claims priority, application Fed. Rep. of Germany, Feb. 2, 1979, 7902832[U]; Sep. 15, 1979, 7926218[U]; Oct. 30, 1979, 7930651[U]**

**Int. Cl.³ A47F *11/10***

**U.S. Cl. 362—125** **17 Claims**




1. Holder for light-transmissive pictures, comprising: a first curved foil of elastic light-transmissive material; a second foil of elastic optical material sprung into the curvature of said first foil and abutting said first foil, the light-transmissive pictures being arranged between the first foil and the second foil; said first foil having bent-together ends; said second foil having bent-together ends overlapping the bent-together ends of said first foil; the bent-together ends of said first foil and of said second foil having overlying cutouts through which means for connecting said two ends are insertable.

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**4,337,506**

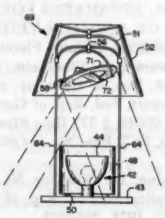
## ADJUSTABLE LAMP

**James I. Terada, 262 Vernon St., Apt. 306, Oakland, Calif. 94610**

**Continuation-in-part of Ser. No. 971,486, Dec. 20, 1978, abandoned. This application Feb. 1, 1980, Ser. No. 117,646**

**Int. Cl.³ F21V *33/00***

**U.S. Cl. 362—142** **11 Claims**




1. A split-beam lighting apparatus for concentrating light from a single source in a plurality of localized areas, comprising:

a frame;

a single light source capable of providing a substantially unidirectional beam of light, supported on the frame,

a plurality of reflecting mirrors positioned in the path of said unidirectional beam of light, with means supporting the mirrors on the frame;

means associated with the mirrors for dividing the light among the mirrors; and

means associated with each of the mirrors for enabling adjustment of the angular orientations of the mirrors to reflect light in a separately selectable direction, to selected localized areas.

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**4,337,507**

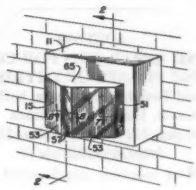
## LIGHTING FIXTURE WITH DIRECTIONAL DISTRIBUTION

**Martin L. Lasker, Edison, N.J., assignor to The Marley-Wylain Company, Mission, Kans.**

**Filed Jun. 12, 1979, Ser. No. 47,799**

**Int. Cl.³ F21V *7/00***

**U.S. Cl. 362—282** **11 Claims**




1. A lighting fixture comprising a housing having an aperture defined in one side thereof, a light source mounted in said aperture, a reflector system partially surrounding said light source and positioned and shaped to project light through said aperture with a main beam of highest intensity projection at a selected angle from downward vertical and with a selected angle of vertical cut-off, the angular position of said reflector system being relative to said housing adjustable about a horizontal axis to adjust the selected angle from downward vertical of said main beam and the selected angle of vertical cut-off, and a lens positioned in said aperture fixed relative to said housing and having a portion thereof shaped to distribute the light rays passing through said aperture horizontally without changing the vertical distribution of light passing through said aperture.

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**4,337,508**

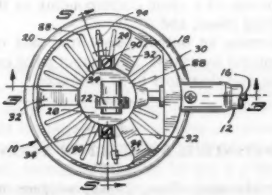
## HIGH WATTAGE LAMP FIXTURE

**David A. Moffatt, Lutsen, Minn., assignor to Moffatt Products, Inc., Lutsen, Minn.**

**Filed Jul. 31, 1980, Ser. No. 173,976**

**Int. Cl.³ F21V *29/00***

**U.S. Cl. 362—294** **5 Claims**




1. For use with a source of electrical energy and an incandescent lamp having a metallic base, a translucent bulb and a metallic center terminal, an incandescent lamp fixture including:

A. a lamp socket of non-electrically conductive material of configuration to receive and retain a metallic lamp base;

B. a first electrical contact in said socket in position to contact said lamp base;

C. a second electrical contact in said socket in position to contact a center terminal of said lamp;

D. electrical circuit means to transmit energy to said first and second electrical contacts;

E. a heat dissipater of material highly conductive to heat in intimate surrounding continuous contact with an outer

surface of said socket over an area at least equivalent and opposite an inner surface facing and contacting said lamp base, said heat dissipater having heat dissipating fins extending radially outwardly from the lamp socket;

F. an open-ended lamp shade fixedly mounted with respect to said dissipater in concentric spaced relation with respect to said socket, said shade encompassing said electrical circuit means, said socket and said heat dissipater and extending past said socket sufficiently to encompass an incandescent lamp when mounted in said socket; and

G. a reflector of material highly conductive to heat and mounted in surrounding relation to said socket in intimate heat conductive relation to said dissipater and in concentric but spaced relation from and inside of said lamp shade.

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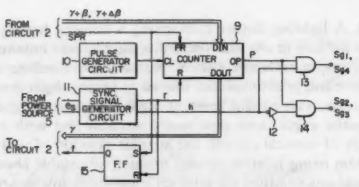
**4,337,509**

## METHOD AND APPARATUS FOR CONTROLLING FIRING PHASES OF THYRISTORS

**Tsutomu Omae, and Toshihiko Matsuda, both of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Filed Jul. 22, 1980, Ser. No. 171,266**
**Int. Cl.³ H02P** *5/16*
**U.S. Cl. 363—128** **15 Claims**




1. A method of controlling the firing phases of thyristors, comprising·

counting clock pulses having a predetermined period, by means of a counter

resetting said counter each time the voltage of an ac power source crosses zero;

reading out the count value of said counter at any desired moment after said resetting step and setting in said counter data obtained by correcting said count value by the use of a value corresponding to the firing phase;

reading out the count value of said counter at any desired moment after said data setting step and setting in said counter data obtained by correcting said count value by the use of a value corresponding to the variation of the firing phase; and

delivering an output pulse from said counter when said counter overflows, said output pulse causing firing pulses for said thyristors to be produced.

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**4,337,510**

## READ CONTROL SYSTEM FOR A CONTROL STORAGE DEVICE

**Juichi Maezumi, Ome, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Japan**

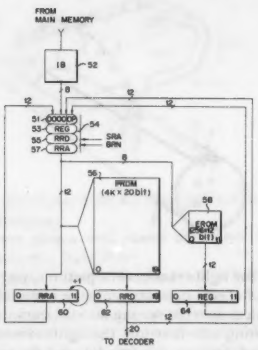
**Filed Feb. 12, 1980, Ser. No. 120,887**
**Claims priority, application Japan, Feb. 16, 1979, 54/16016**
**Int. Cl.³ G06F** *9/22*
**U.S. Cl. 364—200** **15 Claims**

1. A read control system for a control storage device, including an instruction buffer for supplying user instructions including operation codes, the system comprising:

a first read only memory for storing at selectively addressable memory locations thereof, a plurality of microinstructions of microprograms corresponding to said user instructions;

a second read only memory for storing a plurality of addresses for specifying memory locations in the first read only memory, said specified memory locations containing only second microinstructions of the microprograms corresponding to the user instructions;

a first register for holding a microinstruction read out from the first read only memory, said microinstruction selectively corresponding to either (1) a start microinstruction read out from said first read only memory from a memory location specified by address data comprising an operation code of a user instruction supplied by the instruction buffer, said user instruction being selectively supplied to said first read only memory concurrently with an outputting from the first register of a last microinstruction of a microprogram corresponding to a preceding user instruction, or (2) a second microinstruction read out from a




memory location specified by an address derived from the second read only memory, said latter address specified by the address data comprising the operation code of the user instruction, said user instruction being selectively supplied to said second read only memory; and

a second register for holding an address read out from the second read only memory, said last address being read out from said second read only memory in parallel with the reading out of the start microinstruction from the first read only memory into the first register, and for supplying said address to the first read only memory in parallel with the outputting of said start microinstruction from said first register.

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**4,337,511**

## DIGITAL CONTROL APPARATUS FOR THE RUNNING SPEED OF A MOTOR VEHICLE

**Erich Schneider, Kirchheim; Helmut Fleischer, Schwieberdingen; Wolfgang Nonnenmann, Pforzheim, and Benno Gerum, Stuttgart, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany**

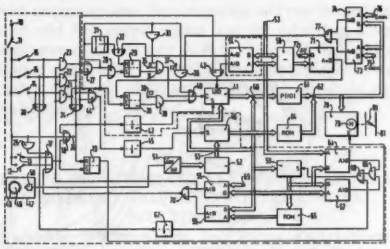
**PCT No. PCT/EP79/00048, § 371 Date Mar. 15, 1980, § 102(e) Date Mar. 10, 1980, PCT Pub. No. WO80/00277, PCT Pub. Date Feb. 21, 1980**
**PCT Filed Jun. 21, 1979, Ser. No. 190,318**
**Claims priority, application Fed. Rep. of Germany, Jul. 15, 1978, 2831238; Sep. 27, 1978, 2842023**
**Int. Cl.³ G05D** *13/58;* **B60K** *31/00*
**U.S. Cl. 364—426** **30 Claims**

1. In a digital control apparatus for controlling the running speed of a motor vehicle comprising an actual-value sending unit for sending a signal corresponding to the actual value of the vehicle running speed; a demand-value memory means **(46)** for storing a demand-value that is a function of the desired running speed of the vehicle; at least one switching means **(14)**; means for transferring said actual value into said demand-value memory apparatus upon the actuation of said at least one switching means **(14)**; comparing means **(54)** for comparing said actual-value with said stored demand-value; and control means responsive to said comparing means for controlling an

element of the motor vehicle influencing the speed of the motor vehicle;

the improvement comprising:

an auxiliary demand-value memory apparatus (41) for generating a ramp function signal by means of a digital counting



process, said auxiliary demand-value memory apparatus being coupled to said control means for supplying said ramp function signal as a supplementary demand-value during a running speed alteration to be effected by the control apparatus.

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## 4,337,512

## APPARATUS AND METHOD FOR CONTROLLING INTERNAL COMBUSTION ENGINE

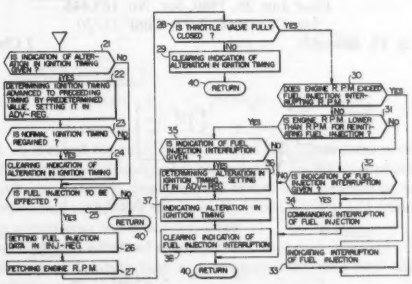
**Toshio Furuhashi, Ibaraki, Japan, assignor to Hitachi, Ltd., Tokyo, Japan**

**Filed Oct. 1, 1979, Ser. No. 80,203**

**Claims priority, application Japan, Sep. 29, 1978, 53-119349**

**Int. Cl.[3] F02P *5/06*; F02M *3/04***

**U.S. Cl. 364—431.09** **7 Claims**



1. A method of operating a processor-controlled internal combustion engine, wherein control signals for controlling the supply of fuel and ignition timing for the engine are generated in response to data produced in accordance with signals indicative of operating conditions of the engine, comprising the steps of:

(a) in response to the throttle valve of the engine being in the fully closed position and in response to the engine crankshaft speed exceeding a preselected speed generating a first control signal in response to which the supply of fuel to the engine is interrupted;

(b) in response to the occurrence of a prescribed condition of engine operation for which the supply of fuel to the engine is to be resumed, generating a second control signal in response to which the ignition timing is modified by a prescribed amount and setting a flag representative of said modification of the ignition timing; and

(c) in response to said flag representative of said modification of the ignition timing being set, causing the amount by which said ignition timing has been modified by said second control signal to be sequentially adjusted until the ignition timing corresponds to the ignition timing in accordance with which said engine is normally operated and thereupon resetting said flag and resuming normal ignition.

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## 4,337,513

## ELECTRONIC TYPE ENGINE CONTROL METHOD AND APPARATUS

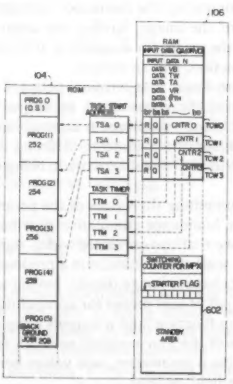
**Toshio Furuhashi, Mito, Japan, assignor to Hitachi, Ltd., Tokyo, Japan**

**Filed Apr. 4, 1980, Ser. No. 137,519**

**Claims priority, application Japan, Apr. 6, 1979, 54-40901; Jun. 6, 1979, 54-70067**

**Int. Cl.[3] G06F *9/46*; G05B *15/02***

**U.S. Cl. 364—431.11** **46 Claims**



1. A method of operating a processor-controlled system, in which output signals are produced as a result of the processor carrying out a plurality of tasks the functions of which affect the operation of said system, and wherein there are provided a plurality of task programs through the execution of which said tasks are performed, each task program having a prescribed level of priority assigned thereto in accordance with its functional effect on the operation of said system, comprising the steps of:

(a) generating successive interrupt signals to which said processor responds in executing said task programs;

(b) in response to a respective one of said interrupt signals, issuing execution request signals for task programs currently requiring service;

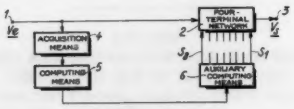
(c) upon completion of step (b), initiating the execution of the task program or programs, the task program level of which is highest among those programs for which execution request signals have been generated in step (b); and

(d) upon completion of the execution of a task program or programs in step (c), determining which task program or programs is to be next executed and thereupon proceeding with its execution.

## 4,337,514
## DEVICE FOR AUTOMATICALLY CONTROLLING THE TRANSFER FUNCTION OF A VIDEO SYSTEM FOR IMPROVING IMAGE PERCEPTION

**Michel Favreau; Jean Bajon; Michel Cattoën; Serge Soca; Maurice Longuet, and Christian Delattre, all of Paris, France, assignors to Thomson-CSF, Paris, France**

**Filed May 12, 1980, Ser. No. 148,676**
**Claims priority, application France, May 11, 1979, 79 11991**
**Int. Cl.³ H04N** *3/00;* **G06F** *15/36*
**U.S. Cl. 364—515** **5 Claims**




1. A device for automatically controlling the transfer function of a video system for improving image perception, comprising:

means for acquisition of the luminance distribution function of an image by statistical analysis of the values of samples of a video signal, sampled at a frequency greater then ten percent of the maximal frequency of the video signal, said means having one input for receiving the video signal and an output;

means for computing the luminance cumulative distribution function of the image, having one input coupled to the output of the means for acquisition of the luminance distribution function, and an output;

an analog non-linear four-terminal network having an input for receiving the video signal, an output for delivering a corrected video signal, and n control inputs for controlling the values of n parameters defining the transfer function of the four terminal network, n being a positive whole number;

means for computing the values of the parameters as a function of the luminance cumulative distribution function so as to ensure that the corrected video signal extends over the entire scale of luminances in a predetermined distribution that enhances image details, having an input coupled to the output of said means for computing the cumulative distribution function, and n outputs coupled to the n control inputs of the four-terminal network for supplying the values of the n parameters, said values being constants for one image field, at least.

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## 4,337,515
## AUTOMOTIVE ENGINE ANALYZER FOR INDICATING A NO-CONNECTION CONDITION OF ENGINE TEST LEADS

**Keith A. Kreft, Mt. Prospect, Ill., assignor to Sun Electric Corporation, Crystal Lake, Ill.**

**Filed Apr. 15, 1980, Ser. No. 140,585**
**Int. Cl.³ G06F** *11/00*
**U.S. Cl. 364—551** **10 Claims**

1. An engine analyzing device for analyzing the operational characteristics of an internal combustion engine, comprising:

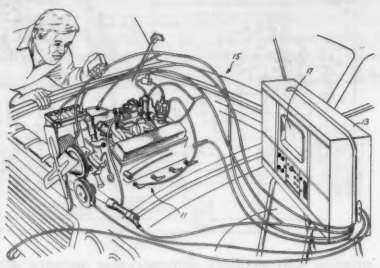
a test lead electrically connectable to an internal combustion engine for receiving an engine test signal, said test lead developing a disconnect voltage level when said test lead is disconnected from the engine;

a ground lead electrically connectable to the internal combustion engine for providing a ground reference;

signal referencing means interconnected between said test lead and said ground lead for representing said test signal as a voltage signal having a voltage magnitude lying within a predetermined range, said referencing means including:

(i) an output conductor for transmitting said voltage signal as an output voltage signal; and

(ii) impedance source means connected to said test lead and establishing a non-zero reference signal as an output voltage signal on said output conductor when said test lead is disconnected from the internal combustion engine, said output voltage signal on said output conductor remaining



relatively unaffected by said impedance source means when said test lead is connected to said engine despite the presence of a test signal on said test lead of a voltage level substantially equal to said disconnect voltage level; and

signal processing means for receiving said output voltage signal and being responsive to said non-zero reference signal for generating an error indication to the operator.

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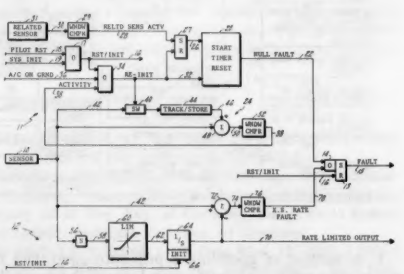
## 4,337,516
## SENSOR FAULT DETECTION BY ACTIVITY MONITORING

**Richard D. Murphy, and Douglas H. Clelford, both of Trumbull, Conn., assignors to United Technologies Corporation, Hartford, Conn.**

**Filed Jun. 26, 1980, Ser. No. 163,445**
**Int. Cl.³ G06G** *7/78;* **G06F** *15/20*
**U.S. Cl. 364—551** **2 Claims**




1. An activity-monitored sensor system comprising:

a first sensor providing a first output signal indicative of a given physical parameter; and

a second sensor providing a second output signal indicative of a second parameter related to said given physical parameter so that said second output signal is also indicative of whether said first output signal should or should not be changing as a function of time;

characterized by:

signal processing means connected for response to the output signals of said first and second sensors, for providing signals indicative of first, second and third predetermined threshold signal magnitudes, responsive to said second output signal for providing a first excess signal indicative of said second parameter being in excess of a first one of said predetermined threshold signal magnitudes for providing a second excess signal indicative of a change in the

magnitude of said first output signal in excess of a second one of said predetermined threshold signal magnitudes, for providing a signal indicative of null fault in response to presence of said first excess signal concurrently with absence of said second excess signal for a predetermined interval of time, for providing in response to said first output signal a rate limited signal indicative of said given physical parameter limited as to the rate of change thereof with respect to time, for comparing said rate limited signal with said first output signal, and for providing a signal indicative of excess rate fault in the event that said rate limited signal differs from said first output signal by more than a third one of said predetermined threshold signal magnitudes.

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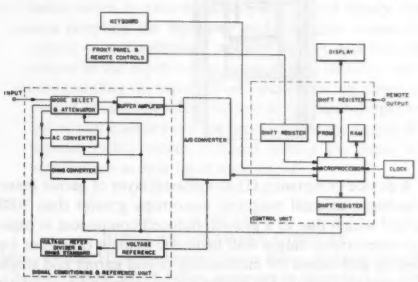
## 4,337,517
## METHOD OF AUTOMATICALLY CALIBRATING A MICROPROCESSOR CONTROLLED DIGITAL MULTIMETER

**Walter Nickel, Walnut Creek, and Zoltan Tarczy-Hornoch, Berkeley, both of Calif., assignors to Systron Donner Corporation, Concord, Calif.**

**Continuation-in-part of Ser. No. 724,005, Sep. 16, 1976, Pat. No. 4,200,933, which is a continuation-in-part of Ser. No. 710,218, Jul. 30, 1976, abandoned. This application Oct. 22, 1979, Ser. No. 86,722**

**Int. Cl.³ G01R *35/00*; G06F *15/20***

**U.S. Cl. 364—571** **1 Claim**




1. A method for rapid calibration of a microprocessor controlled digital multimeter having a set of analog components which can produce measurement errors and a subset of said components which are substantially more precise and removable comprising the following steps:

removing said subset of components;

replacing said subset with a previously calibrated equivalent subset; and

using said microprocessor and said equivalent subset to arithmetically remove the measurement errors caused by said set of analog components, wherein said arithmetical removal step is based on the precision of said previously calibrated equivalent subset.

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## 4,337,518
## RECURSIVE-TYPE DIGITAL FILTER WITH REDUCED ROUND-OFF NOISE

**Makoto Ohnishi, Tokyo; Hiroshi Kuwahara, and Narimichi Maeda, both of Kodaira, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

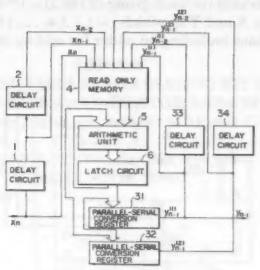
**Continuation of Ser. No. 937,978, Aug. 30, 1978, abandoned. This application Jul. 28, 1980, Ser. No. 172,947**

**Claims priority, application Japan, Feb. 15, 1978, 53-15397**

**Int. Cl.³ G06F *7/38***

**U.S. Cl. 364—724** **9 Claims**

1. In a recursive-type digital filter having a calculating means for calculating an output signal $y_n$, and a first means for supplying said calculating means with at least an m-bit input signal $x_n$ of




$$\sum_{k=0}^{M} x_{n-k}$$

one bit by one bit; and second means including a data conversion means which cooperates with said calculating means to delay by one sample period said output signal $y_n$, and a feedback means for feeding back one bit by one bit to said calculating means at least an m-bit output signal $y_{n-1}$ of

$$\sum_{k=1}^{N} y_{n-k}$$

wherein M and N are positive integers which represent a delay of the signal transmission and wherein the respective signals received by said calculating means from said first and said feedback means are multiplied by corresponding weighting coefficients $a_k$ and $b_k$ in order to produce at every sampling period a (m+l)-bit data $y_n$ satisfying,

$$y_n = \sum_{k=0}^{M} a_k x_{n-k} + \sum_{k=1}^{N} b_k \cdot y_{n-k}$$

and $a_k$ and $b_k$ represent coefficients with $a_M$, $b_N \neq 0$ with the upper m-bits of said data $y_n$ being serially outputted as an output signal corresponding to said input signal $x_n$ from said filter, wherein the improvements comprises:

third means including a second data conversion means which cooperates with said calculating means to delay by one sampling period at least one of the lower l bits of said data $y_n$ and outputting a $y'_{n-1}$ signal, and

fourth means receiving said $y'_{n-1}$ signal and outputting one bit by one bit to said calculating means a $y'_{n-k}$ signal so that said calculating means supplements said $y_n$ data by adding the product of said $b_k$ coefficient and the signal received from said fourth means, whereby said $y'_{n-k}$ signal, which is delayed by k sampling periods from said input signal $x_n$, reduces round off errors.

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## 4,337,519
## MULTIPLE/DIVIDE UNIT

**Tetsunori Nishimoto, 395-26, Shimosakunobe, Takatsu-ku, Kawasaki-shi, Kanagawa 213, Japan**

**Filed Jan. 28, 1980, Ser. No. 115,619**

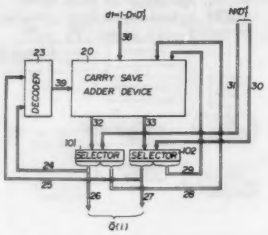
**Claims priority, application Japan, Feb. 1, 1979, 54-009709**

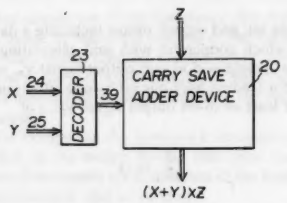
**Int. Cl.³ G06F *7/48, 7/52***

**U.S. Cl. 364—736** **7 Claims**

1. A multiply/divide unit for a high-performance digital computer for processing data X, Y and Z which comprises a decoder for receiving respective corresponding bits of the data X,Y and for outputting selecting signals for given multiples of

the data Z without adding X and Y; and means for obtaining values corresponding to products of the data Z and said given multiples selected by said selecting signals and adding said values, wherein said decoder includes a plurality of logical means provided for each group of the $2j-1^{th}$ bit and the $2j^{th}$ bit of the data X and Y in which $j=1,2,3,4,\ldots$; the $j^{th}$ one of said logical means including an adder for adding the corresponding




$2j-1^{th}$ bit and $2j^{th}$ bit groups of the data X and Y to output an uppermost bit $a_{2j}$, an intermediate bit $b_{2j}$ and a lowermost bit $d_{2j}$ and a decoding means for carrying out an operation of $[(d_{2j-2} \oplus a_{2j}) \times 2 + b_{2j} + (d_{2j} \vee a_{2j+2})]$ based on the outputs of said adder and outputs $a_{2j+2}$ and $d_{2j-2}$ from adders of the $j+1^{th}$ logical means and $j-1^{th}$ logical means to thereby generate the selecting signals for the given multiples relative to data Z.

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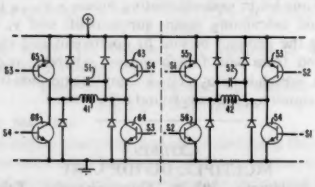
**4,337,520**

## BUBBLE MEMORY DRIVER

**Frank F. Judd, Madison, and George R. Westerman, Denville, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.**

**Filed Aug. 11, 1980, Ser. No. 177,119**
**Int. Cl.³ G11C *19/08***
**U.S. Cl. 365—6** **3 Claims**



1. A magnetic bubble memory driver for moving magnetic bubbles in a layer of magnetic material in which said bubbles can be moved, said driver comprising first and second coils arranged transverse to one another and adapted for producing a reorienting magnetic field in the plane of said layer, said driver also comprising first and second switched coil drive circuit means including first and second switching transistors for applying square wave voltages to said first and second coils respectively at a base drive frequency and first and second capacitors connected with said coils in such a manner as to delay the rise of voltage across said switching transistors respectively with respect to the decay of current in said transistors at turn-off, said first and second capacitors having first and second values smaller than that at which the associated one of said coils would resonate at said base drive frequency chosen for minimizing semiconductor conduction and switching losses in said drive circuit means.

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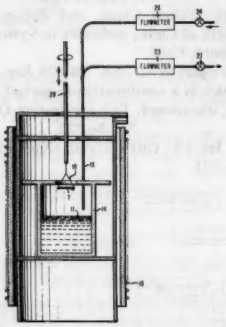
**4,337,521**

## ADVANTAGEOUS GARNET BASED DEVICES

**Stuart L. Blank; Ernst M. Gyorgy, both of Madison; Roy C. LeCraw, Westfield, and Lars C. Luther, Basking Ridge, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.**

**Filed Dec. 26, 1979, Ser. No. 106,399**
**Int. Cl.³ H01F *1/37***
**U.S. Cl. 365—33** **12 Claims**



1. A device comprising (1) an epitaxial layer of garnet material having a uniaxial magnetic anisotropy greater than 7000 ergs/cm³ which due to a growth induced component is capable of supporting a single wall magnetic domain (2) means for producing and means for maintaining in said garnet said single wall magnetic domain (3) means for propagating said single wall magnetic domain in said garnet and (4) means for detecting the presence of said single wall magnetic domain, such that said garnet material comprises a composition nominally represented by the formula $\{A\}_3[B]_2(C)_3O_{12}$, wherein said composition includes sufficient iron ions to produce a magnetic moment in said garnet characterized in that B also includes a member of the group consisting of $Co^{2+}$ and an ion having $5d$ or $4d$ electrons wherein the number of said electrons is 1, 2, 4 or 5, and A is substantially devoid of a typical combination capable of producing a magnetic anisotropy, said typical combination represented by A being $X_{3-y}Z_y$ where X is the magnetic rare earth ion of highest mole fraction in A, Z is the remaining composition of A, and $0.1<y<2.9$.

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**4,337,522**

## MEMORY CIRCUIT WITH MEANS FOR COMPENSATING FOR INVERSION OF STORED DATA

**Roger G. Stewart, Neshanic Station, N.J., assignor to RCA Corporation, New York, N.Y.**

**Filed Apr. 29, 1980, Ser. No. 145,324**
**Int. Cl.³ G11C *7/00***
**U.S. Cl. 365—190** **10 Claims**

1. The combination comprising:

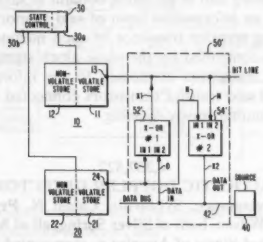
a memory cell having an input-output terminal and having a volatile section and a non-volatile section including means for transferring information between the volatile and non-volatile section and wherein the contents of said memory cell undergo an inversion when information

transferred from said volatile section to said non-volatile section is recalled from said non-volatile section into said volatile section;

a reference cell having an output point, said reference cell being keyed to said memory cell whereby the contents of said reference cell undergo an inversion whenever the contents of said memory cell undergo an inversion;

a data bus adapted to receive an input data signal;

first, and second gate means, each gate means having two inputs and an output and each being responsive to the signals at its two inputs for producing a signal of first



binary significance when its two inputs are of like binary value and for producing a signal of second binary significance when its two inputs are of different binary value;

means coupling the inputs of said first gate means to the output of said reference cell and to said data bus and its output to the input-output point of said memory cell; and

means coupling the inputs of said second gating means to the output of said reference cell and to the input-output terminal of said memory cell for producing at the output of said second gating means a signal having the same binary significance as said input data signal.

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**4,337,523**

## BIPOLAR MEMORY CIRCUIT

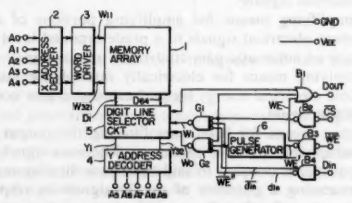
**Atsuo Hotta, Higashiyamato; Yukio Kato, Kodaira, and Teruo Isobe, Hinode, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Filed Jun. 9, 1980, Ser. No. 157,953**

**Claims priority, application Japan, Aug. 29, 1979, 54-109151**

**Int. Cl.³ G11C *7/00***

**U.S. Cl. 365—194** **8 Claims**



1. A bipolar memory circuit comprising:

a plurality of memory cells,

an address decoder which receives an address signal and which provides a signal for selecting one of the plurality of memory cells corresponding to the address signal,

a pulse generator which is started by a write enabling signal and which provides a pulse signal having a fixed pulse duration, and

a gate circuit which receives an input data signal and the pulse signal and which provides a write pulse signal corresponding to the input data signal to be written into the selected memory cell, for a period determined by said pulse signal.

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**4,337,524**

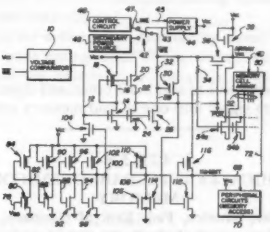
## BACKUP POWER CIRCUIT FOR BIASING BIT LINES OF A STATIC SEMICONDUCTOR MEMORY

**Ward D. Parkinson, Boise, Id., assignor to Mostek Corporation, Carrollton, Tex.**

**Filed Feb. 7, 1980, Ser. No. 119,538**

**Int. Cl.³ G11C *11/40***

**U.S. Cl. 365—229** **3 Claims**



1. A circuit for utilizing a backup power source to prevent loss of the bit pattern stored in the memory cells of a static semiconductor memory upon failure of the primary power supplied thereto, the memory circuit having a plurality of control terminals for receiving control signals and the memory cells having bit lines for transferring information as voltage states to and from the memory cells, comprising:

means for detecting a failure of the primary power for the memory circuit,

means for connecting the backup power source to the memory cells through a selected one of the control terminals upon detection of the failure of the primary power, and

means for applying a predetermined voltage to each of the bit lines upon detection of the failure of the primary power, said predetermined voltage derived from the backup power source through said selected control terminal.

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**4,337,525**

## ASYNCHRONOUS CIRCUIT RESPONSIVE TO CHANGES IN LOGIC LEVEL

**Yasuo Akatsuka, Tokyo. Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan**

**Filed Apr. 11, 1980, Ser. No. 139,595**

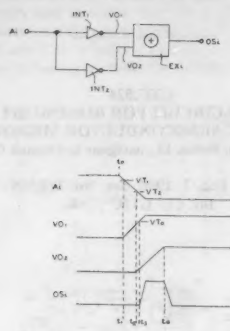
**Claims priority, application Japan, Apr. 17, 1979, 54-46848; Nov. 7, 1979, 54-144178; Nov. 8, 1979, 54-144693; Nov. 8, 1979, 54-144694**

**Int. Cl.³ G11C *8/00***

**U.S. Cl. 365—233** **10 Claims**

10. A memory integrated circuit comprising input means for receiving a plurality of input address signals, a plurality of memory cell means, access means for selectively accessing said memory cell means, means for receiving a write command signal, means for receiving a write data signal which is not classified into binary logic levels, detection means for detecting non-logic level in said input address signals, said non-logic levels being non-classifiable into said binary logic levels, signal means responsive to an output of said detection means for producing a control signal, means for substantially synchronizing said write command signal with said control signal to

produce an inner command signal, means for resetting said access means substantially in response to said control signal,



and means responsive to said inner command signal for writing said write data signal into one of said memory cells.

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## 4,337,526
## MONOLITHICALLY INTEGRABLE SEMICONDUCTOR MEMORY

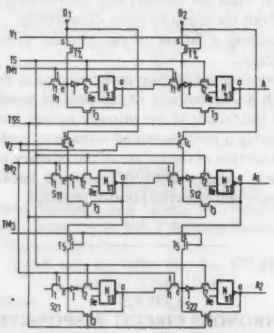
**Helmut Rösler, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany**

**Filed Jun. 9, 1980, Ser. No. 157,946**

**Claims priority, application Fed. Rep. of Germany, Jun. 18, 1979, 2924526**

**Int. Cl.³ G11C** *11/40*

**U.S. Cl. 365—238** **4 Claims**



1. Monolithically integrated MOS semiconductor circuit, comprising a memory matrix having identical memory cells in the form of individual adjacent clock-controlled shift register cells disposed in rows and columns including a first row and column, each of said memory cells having an information input terminal and an information output terminal, at least one of said terminals of each given memory cell being connected to another memory cell disposed in one of the same column and the same row as said given memory cell in accordance with a given sequence of said memory cells in respective rows and columns, said input terminals of said memory cells in at least one of said first row and column each forming an information input of said memory matrix in which said output terminal of said individual memory cells is in the form of a NOR gate having first and second inputs and an output, said first input of said NOR gate being a resetting input, each given memory cell having a first transfer transistor controlled by a first pulse sequence, a second transfer transistor controlled by a second pulse sequence, and at least one clock-controlled transfer transistor each having source-drain paths, and an inverter having an input and an output, said second input of said NOR gate being connected through the source-drain path of said first transfer transistor to the output of said inverter, said output of said NOR gate being fed back through said source-drain path of said second transfer transistor to the input of said inverter, the input of said inverter also forming the signal input terminal of said given memory cell, said signal input terminal of said given memory cell being connected through the source-drain path of said at least one clock-controlled transfer transistor to one of, the output terminal of the adjacent memory cell in the same row as said given memory cell, the output terminal of the adjacent memory cell in the same column as said given memory cell, and an information input of said memory matrix, the corresponding transfer transistor of each memory cell being jointly clock-controlled by the same clock signal preventing said transfer transistors connected to the information input terminals and said transfer transistors connected to said NOR gates from simultaneously opening.

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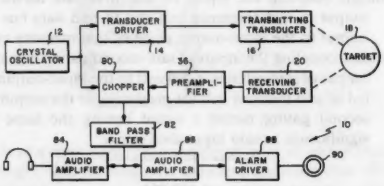
## 4,337,527
## ACOUSTIC DOPPLER DETECTOR

**Arthur D. Delagrange, Sykesville; Cabell N. Pryor, Jr., and Wayne D. Wilson, both of Silver Spring, all of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.**

**Filed Sep. 29, 1971, Ser. No. 184,903**

**Int. Cl.³ G01S** *15/50*

**U.S. Cl. 367—98** **8 Claims**




1. An acoustic doppler detection system for detecting underwater targets comprising:

transmitting means coupled to a source of ultrasonic electrical energy for converting said ultrasonic energy into acoustic energy and for transmitting said acoustic energy;

receiving means for receiving reflections of said acoustic energy and for converting said reflections into received electrical signals;

preamplifying means for amplifying portions of said received electrical signals to a predetermined level to produce an automatic gain controlled output signal;

multiplying means for electrically multiplying said ultrasonic electrical energy by said automatic gain controlled output signal;

filtering means for band pass filtering the output of said multiplying means to produce a difference signal; and

output means coupled to said band pass filtering means for generating a plurality of output signals in response to acoustic reflections from said underwater targets.

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## 4,337,528
## MOVING VEHICLE SEISMIC TARGET DETECTOR

**Glenn G. Clinard; Gail R. Mulhollam, both of Upland, Calif., and Frank J. Volk, Hickory Hills, Ill., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.**

**Filed Dec. 13, 1972, Ser. No. 314,646**

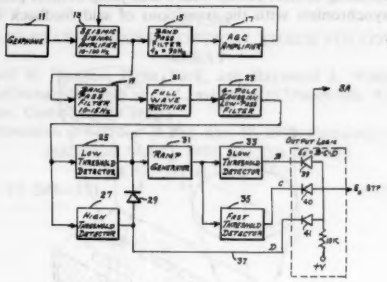
**Int. Cl.³ G08B** *13/00*

**U.S. Cl. 367—136** **4 Claims**

1. A seismic target detector comprising:

a. a geophone;

b. a band pass amplifier fed by the geophone;
c. a first bandpass filter fed by the bandpass amplifier;
d. a full wave rectifier fed by the first bandpass filter;
e. a Gaussian low pass filter fed by the full wave rectifier;
f. a low threshold detector fed by the Gaussian filter;
g. a high threshold detector fed by the Gaussian filter;




h. a ramp generator fed by the low threshold detector and the high threshold detector; and
i. logic means by the ramp generator and the high threshold detector producing an output upon the presence of the target.

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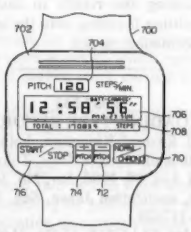
**4,337,529**
**PACE TIMING DEVICE**

**Shigeru Morokawa, Tokorozawa, Japan, assignor to Citizen Watch Company Limited, Tokyo, Japan**

**Filed May 23, 1979, Ser. No. 41,564**
**Claims priority, application Japan, May 27, 1978, 53-063705**
**Int. Cl.³ G04B** *47/00;* **G04F** *8/00;* **G04C** *2/16;* **G08B** *3/10*
**U.S. Cl. 368—10** **25 Claims**




1. A combination of an electronic timepiece and pace timing device, comprising:
a source of a first frequency signal;
pace signal generation circuit means responsive to said first frequency signal for providing a pace signal;
an acoustic device responsive to said pace signal for providing an audible pace timing signal;
said first frequency signal source including a source of a timebase signal, externally operated frequency setting means, and synthesizer circuit means responsive to operation of said frequency setting means and to said timebase signal for producing a first frequency signal;
said pace signal generation circuit means including a frequency divider coupled to receive said timebase signal for thereby producing a carrier signal and time unit signal, and a modulator circuit for modulating said carrier signal by said first frequency signal to thereby produce a pace signal; and
a timekeeping counter circuit coupled to receive said time unit signal produced by said frequency divider circuit for thereby producing a time marker signal when a predetermined count of said time unit signal is attained, said time marker signal being applied to said modulator circuit to modulate said carrier signal for thereby producing a modulated time marker signal, said acoustic device being responsive to said modulated time marker signal for producing an audible time marker signal;
externally actuated switch means for selecting a timekeeping mode of operation and a pace timing mode of operation;
externally actuated switch means for selectively increasing and decreasing a pace timing signal frequency when said pace timing mode of operation is entered;
externally actuated switch means for initiating halting production of an audible pace timing signal when said pace timing mode of operation is entered;
display means for displaying current time and date when said timekeeping mode of operation is entered and for displaying an elapsed time when said pace timing mode of operation has been entered;
display means for indicating a pace timing signal frequency when said pace timing mode of operation is entered; and
display means for indicating a cumulative total of steps executed.

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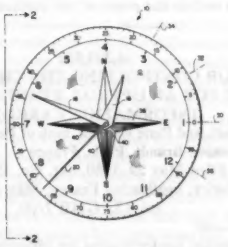
**4,337,530**
**UNIVERSAL TIME-KEEPING SYSTEM AND APPARATUS**

**Leonard L. Toft, Jr., 599 Darwin, Apt. No. 3, Salt Lake City, Utah 84103**

**Filed May 27, 1980, Ser. No. 153,433**
**Int. Cl.³ G04B** *47/06, 19/26;* **G04C** *17/00*
**U.S. Cl. 368—62** **13 Claims**



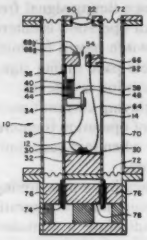
1. A time-keeping method comprising the steps of:
(a) dividing a day into twelve equal periods of time, each period of time being designated with successively increasing numbers starting with one and increasing to twelve;
(b) dividing each of said twelve equal periods of time into one-hundred equal sub-periods of time;
(c) dividing each of said sub-periods of time into one-hundred equal increments of time;
(d) using said increments of time as the basic time interval around which a timing device is designed, said timing device being adapted to display the passage of time as a counter-clockwise motion around a face of said timing device, said counter-clockwise motion depicting one counterclockwise revolution around said face once each day, said face being adapted to indicate the passage of time in units comprised of said periods of time, sub-periods of time, and increments of time; and
(e) synchronizing said timing device so that said counter-clockwise motion begins from a beginning reference point on said face that corresponds to the three o'clock position of a conventional clock face at a time that is coincident with the mean time of the rising of the sun.

**4,337,531**

## SCANNING HEAD FOR AN OPTICAL DISC SYSTEM

**Herman W. Willemsen, Nepean, Canada, assignor to Northern Telecom Limited, Montreal, Canada**

**Filed May 14, 1980, Ser. No. 149,765**
**Int. Cl.³ G11B 7/12**
**U.S. Cl. 369—45** **11 Claims**



1. An optical scanning device for scanning an optical record at a reflecting surface of an optical storage disc, the optical scanning device comprising:

a support frame;

an optical source fixedly mounted relative to the frame;

a single length of optical fiber having one end disposed to receive light from the source, such light being emitted from the other end of the optical fiber;

an objective lens for focussing the emitted light at a focus position on the surface of the optical disc;

monitoring means for monitoring light reflected from the surface of the optical disc;

guide means responsive to an output from said monitor means to alter the position of the other end of the fiber relative to said objective lens whereby to alter the focus position within the plane of the surface of the disc.

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**4,337,532**

## SYSTEM FOR CONTROLLING THE CHANGE OF READ SIDE FOR AN OPTICAL READER FOR AN INFORMATION CARRIER

**Pierre Oprandi, and Rene Romeas, both of Paris, France, assignors to Thomson-Brandt, Paris, France**

**Filed May 29, 1980, Ser. No. 154,435**
**Claims priority, application France, May 31, 1979, 79 13981**
**Int. Cl.³ G11B 7/00**
**U.S. Cl. 369—45** **7 Claims**

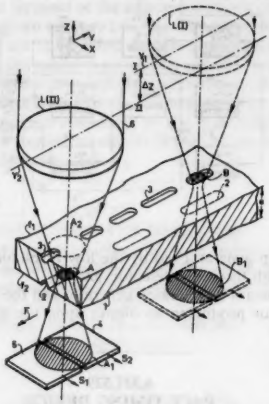
1. In an optical reader system for changing the read side of a carrier of information recorded on both sides, said reader system having an optical focusing device for focusing a light beam onto a designated one of said both sides and focusing control circuit with a feedback loop in order to maintain a constant distance between said optical device and the surface of said carrier by servoaction on an electrical signal, the improvement comprising:

detection means for receiving a high frequency modulated electrical output signal read off said carrier by said optical reader and supplying a detected signal in the form of a first binary signal of a first logic level when the amplitude of said high frequency modulated electric signal exceeds a predetermined threshold and a second logic level when the amplitude of said high frequency modulated electrical signals is below said threshold;

first control means for generating a second binary signal for controlling the change of read side having two logic levels representing the two sides to be read;

second control means combining said first binary signal and second binary signal for controlling the change of read side for creating a feedback loop opening/closing binary signal which can assume a first logic level controlling the opening of the feedback loop after receiving a transition of said second binary signal controlling the change of reading sides and a second logic level controlling the closing of said feedback loop after receiving a transition of the first binary signal from the second to the first logic level; and

a side jump control pulse generator connected to the outputs of said first and second control means for supplying said focusing control circuit with a side jump control pulse in synchronism with the transitions of said feedback loop



opening/closing binary signal with the polarity of said jump control pulse being selected so that it alternately imparts to said optical focusing device an acceleration movement towards the preselected side during the transition from said first to said second logic level of said feedback loop opening/closing binary signal and a decelerated movement during the return to said first logic level thereby permitting focusing onto the selected side of said recorded information carrier.

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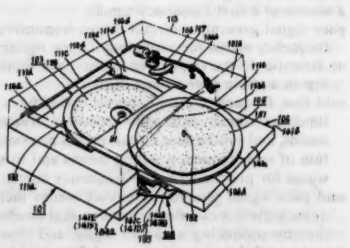
**4,337,533**

## FRONT LOADING TYPE RECORD PLAYER

**Ryuta Ando, and Kazumi Kinugawa, both of Tokyo, Japan, assignors to Kabushiki Kaisha Aiwa, Tokyo, Japan**

**Filed Aug. 28, 1980, Ser. No. 182,178**
**Claims priority, application Japan, Sep. 7, 1979, 54-114936; Sep. 13, 1979, 54-117639**
**Int. Cl.³ G11B 17/04, 23/02**
**U.S. Cl. 369—77** **17 Claims**



1. A front loading type record player comprising a frame, a first turntable rotatably disposed on said frame, a support means slidably mounted on said frame, said support means being slidable between a playing position located in the frame and a loading position extending outwardly of the frame, and a

second turntable carried on said support means, said second turntable receiving a record when said support means is in said loading position, said second turntable being transferred to and supported by said first turntable when said support means is in said playing position, whereby the first and second turntables rotate as a unit during playing of the record.

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**4,337,534**

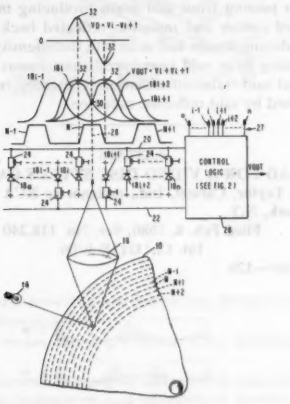
## SOLID STATE ELECTRO-OPTICAL TRACK FOLLOWER ARRAY

**Albert R. Basilico, Hyde Park, and Raymond J. Wilfinger, LaGrangeville, both of N.Y., assignors to Discovision Associates, Costa Mesa, Calif.**

**Continuation of Ser. No. 31,252, Apr. 18, 1979, abandoned. This application Mar. 3, 1981, Ser. No. 239,953**

**Int. Cl.**[3] **G11B** *7/00, 7/12*

**U.S. Cl. 369—111** **5 Claims**




1. A tracking circuit for use in a playback system for an optical information storage device which optically reads information from a spiral shaped track carried by a rotating data disc, comprising:

a multiplicity of adjacently positioned photo-optic sensors, and each of said sensors having an output terminal;

means for illuminating said spiral shaped track;

means for imaging light reflected from the spiral shaped track upon at least two of said light sensitive devices;

each of said multiplicity of photo-optic sensors being employed for generating an output voltage representative of the intensity of the light impinging upon said sensor at its respective output terminal;

a lower signal line;

an upper signal line;

a plurality of photo-optic sensor switching means, and each of said photo-optic sensor switching means having at least first, second and third terminals;

alternate ones of said sensors being selectively connected to said lower signal line by respective photo-optic sensor switching means;

remaining ones of said sensors being selectively connected to said upper signal line by respective photo-optic sensor switching means;

said first terminal of each of said photo-optic sensor switching means being connected to one of said lower signal line and said upper signal line;

said second terminal of each of said photo-optic sensor switching means being connected to said output terminal of respective ones of said photo-optic sensors;

a decode circuit means for generating first level and second level control signals for application to said third terminal of each of said photo-optic sensor switching means;

each of said photo-optic sensor switching means operating to connect said voltage generated by its respective photo-optic sensor to its respective upper and lower signal line when said control signal of said first level is present at said third terminal and operating to disconnect said voltage generated by its respective photo-optic sensor from its respective upper and lower signal line when said control signal of said second level is present at said third terminal;

said decode circuit means generating at least one first level control signal for application to one of said photo-optic switching means connecting said sensors to said lower signal line and at least one additional first level control signal for application to an adjacent one of said photo-optic switching means connecting said sensors to said upper signal line;

differential signal combining means responsive to said output voltage signal on said lower signal line and said output voltage signal on said upper signal line as gated by said first level control signals from said decode circuit means for generating at least a first difference output signal and a second difference output signal, said first difference output signal being the difference between a first voltage signal on said upper signal line and a second voltage signal on said lower signal line, and said second difference output signal being the difference between said second voltage signal and said first voltage signal;

said differential signal combining means includes a first differential amplifier for generating said first difference output signal and a second differential amplifier for generating said second difference output signal and each of said first and said second differential amplifiers having a positive input terminal and a negative input terminal;

said differential signal combining means further including a first input amplifier and a second input amplifier;

said first input amplifier being connected to said positive input terminal of said first differential amplifier and to said negative terminal of said second differential amplifier;

said second input amplifier being connected to said positive input terminal of said second differential amplifier and to said negative terminal of said first differential amplifier;

input switching means positioned intermediate said upper and lower signal lines and said first and second input amplifier for selectively connecting said upper signal line with one of said first and second amplifiers and for selectively connecting said lower signal line with the other one of said first and second amplifiers;

said input switching means including at least first and second direct switching means and further including at least first and second cross switching means, and each of said direct and cross switching means having at least first, second and third terminals;

said first terminal of said first direct switching means and said first terminal of said first cross switching means being responsive to said signal on said upper signal line, said first terminal of said second direct switching means and said first terminal of said second cross switching means being responsive to said signal on said lower signal line;

said second terminal of said first direct switching means and said second terminal of said second cross switching means being employed for selectively furnishing an input to said first input amplifier, said second terminal of said second direct switching means and said second terminal of said first cross switching means being employed for selectively furnishing an input to said second input amplifier;

signal generating means responsive to said output signals from said differential signal combining means for providing at least both a first signal indicating said first difference output signal exceeds a first preselected value and second signal indicating said second difference output signal exceeds a second preselected value;

a bistable device of the type having two stable states and at least an input terminal and first and second output terminals;

said bistable device changing between its two stable states

upon each application of an input signal to said input terminal and generating an output signal at each of said first and second output terminals, and each of said output signals at said first and second output terminals being at one of a first signal level and a second signal level, and said output signal at said first output terminal being at said first level when said bistable device in its first stable state and said output signal at said first output terminal being at said second level when said bistable device is in its second stable state, and said output signal level at said second output terminal of said bistable device being at the other level from the level of said output signal at said first output terminal;

said bistable device being responsive to said first signal and said second signal generated by said signal generating means for changing stable states upon the application of said last mentioned signals to said input terminal of said bistable device and for generating said first output signal and said second output signal from said first output terminal and second output terminal respectively;

said first output signal from said bistable device is applied as an input signal to said decode circuit means and as a control signal to said third terminal of said first and second cross switching means;

said second output signal from said bistable device is applied as a second input signal to said decode circuit means and as a control signal to said third terminal of said first and second direct switching means;

said output signals from said bistable device and said output signals from said signal generating means being applied to said decode means for generating said first level signals and said second level signals for application to said photo-optic switching means for changing the combination of adjacent photo-optic sensors used to generate said first difference signal and said second difference signal; and

said output signals from said bistable device applied to said control terminals of said direct and cross input switching means being employed for changing the photo-optic sensor connections over said upper and lower signal lines to said first and second amplifiers as said decode means switches the connections of said photo-optic sensors to said upper and lower signal lines during tracking.

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**4,337,535**

## DEVICE FOR PREVENTING UNWANTED REFLECTIONS FROM AN OPTICAL SYSTEM TO A LASER IN AN APPARATUS FOR OPTICALLY READING A RECORD CARRIER

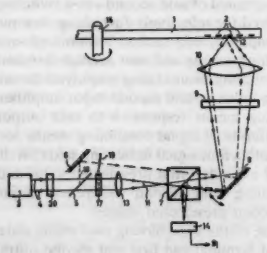
**Everardus A. Van Megen; Carel A. Simons, and Eduard W. Moen, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.**

**Continuation of Ser. No. 804,887, Jun. 9, 1977, abandoned, which is a continuation of Ser. No. 625,182, Oct. 23, 1975, abandoned. This application Feb. 14, 1979, Ser. No. 12,099**

**Claims priority, application Netherlands, Jun. 2, 1975, 7506495**

**Int. Cl.³ G11B** *7/00, 7/12*

**U.S. Cl. 369—121** **4 Claims**



**1.** An apparatus for reading information stored on a record carrier in an optically readable information structure, said apparatus comprising means for producing a coherent beam of radiation having an intensity sufficient to read the information stored in the information structure without causing physical changes in said information structure, means for directing said beam toward said record carrier along a first path, means for focussing said beam to a spot on said information structure to thereby modulate at least a portion of said beam in accordance with the information stored in said information structure, said modulated portion of said beam passing from said record carrier along a second path at least a portion of which is separate and distinct from said first path, a radiation sensitive detector arranged along said separate portion of said second path to intercept said modulated portion of said beam and means for attenuating the intensity of said beam, said attenuating means being positioned along a portion of said first path, which is separate and distinct from said portion of said second path, so as to intercept substantially the entire cross-sectional area of of said beam passing from said beam producing means toward said record carrier and radiation reflected back toward said beam producing means and attenuate the intensity of both the beam passing from said beam producing means toward said carrier and said reflected radiation to thereby reduce optical noise caused by said reflected radiation.

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**4,337,536**

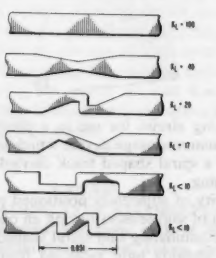
## FLYLEAD FOR A VIDEO DISC STYLUS CARTRIDGE

**Byron K. Taylor, Carmel, Ind., assignor to RCA Corporation, New York, N.Y.**

**Filed Feb. 4, 1980, Ser. No. 118,240**

**Int. Cl.³ G11B** *9/06*

**U.S. Cl. 369—126** **5 Claims**



**1.** A video disc stylus assembly of the type including a signal pickup stylus secured to a first end of a stylus arm, the second end thereof being compliantly mounted to a carriage assembly for translating the pickup stylus radially across a disc record, electrical connection to said pickup stylus being effectuated by a conductive leaf spring secured to the carriage assembly and elastically deformed in an arc to provide a prescribed compressive force between the pickup stylus and the disc record, said leaf spring improved to exhibit reduced resistance to movement in a direction radially across the disc record, which improved leaf spring comprises;

a flat, longitudinal electrically conductive resilient element, having substantially uniform width over its length and having first and second regions of narrow width proximate first and second ends of the element, the width of said narrow regions designed to permit a center section located between said narrow regions to twist a limited amount relatively freely with respect to the ends of said element when said element is elastically deformed in said arc between the carriage assembly and the pickup stylus; and

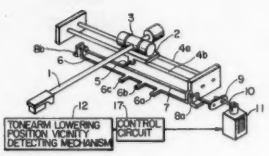
wherein the compressive force between the pickup stylus and the disc record is not substantially affected by said narrowed regions.

4,337,537

## TONEARM POSITION SETTING DEVICE

Yoshihisa Hirota, Tokorozawa, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Apr. 7, 1980, Ser. No. 137,696
Claims priority, application Japan, Apr. 6, 1979, 54-45404[U]
Int. Cl.[3] G11B *17/06*
U.S. Cl. 369—216 3 Claims




1. A tonearm lowering position setting device for a record turntable comprising:

a moving means carrying a tonearm for horizontal movement;

engaging means for engaging said moving means at a desired lowering position of said tonearm to thereby stop the horizontal movement of said tonearm;

driving means for driving said engaging means so as to be in an engaging condition with said moving means in response to a predetermined signal;

detecting means for detecting when said tonearm is positioned in the vicinity of the desired lowering position; and

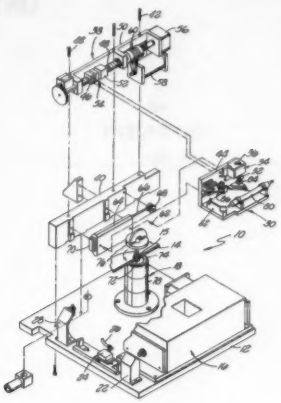
a control means for supplying said predetermined signal to said driving means in response to the output of said detecting means.

4,337,538

## DRIVE ASSEMBLY FOR A VIDEO RECORDER-PLAYBACK MACHINE

Richard L. Wilkinson, Torrance, and John S. Winslow, Alta Dena, both of Calif., assignors to Discovision Associates, Costa Mesa, Calif.

Filed Oct. 20, 1980, Ser. No. 198,696
Int. Cl.[3] G11B *3/10*
U.S. Cl. 369—223 35 Claims



1. A drive assembly for linearly translating a record-playback head in a record-playback machine, comprising:

a slide member mounted on the machine for linear translation with respect thereto, said head being mounted for linear movement with said slide member;

a lead screw mounted on the machine for rotation about its own axis and extending in a direction generally parallel with the direction of translation of said slide member;

a lead screw nut threadably received about said lead screw for axial translation in response to lead screw rotation;

a push block mounted for linear movement with the head and disposed about said lead screw for axial translation with the head generally along said lead screw and out of physical contact with said lead screw;

means for coupling said lead screw nut and said push block against rotation with respect to each other and for accommodating axial misalignment between each other; and

means for rotatably driving said lead screw.

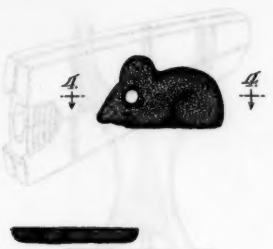
# DESIGN PATENTS

## GRANTED JUN. 29, 1982

### ERRATA

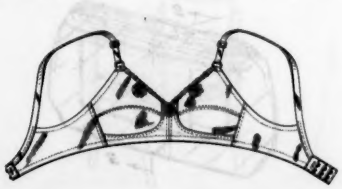
| For CLASS | See PATENT NO. |
|---|---|
| D32–002 | 265,201 |

265,140
CAT BISCUIT
Jeffrey B. Gorman, 65 W. Burton Pl., Chicago, Ill. 60601
Filed Jan. 21, 1980, Ser. No. 113,570
Term of patent 14 years
Int. Cl. D01—*99*
U.S. Cl. D1—27



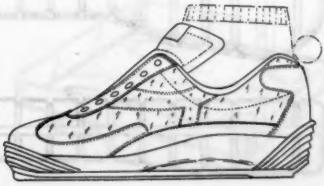
265,141
BRASSIERE
Harold Stern, Wyckoff, N.J., and William White, New York, N.Y., assignors to International Playtex, Inc., Stamford, Conn.
Filed Jul. 14, 1980, Ser. No. 167,861
Term of patent 14 years
Int. Cl. D2—*01*
U.S. Cl. D2—24

265,142
BRASSIERE
Harold Stern, Wyckoff, N.J., and William White, New York, N.Y., assignors to International Playtex, Inc., Stamford, Conn.
Filed Jul. 14, 1980, Ser. No. 168,982
Term of patent 14 years
Int. Cl. D2—*01*
U.S. Cl. D2—24



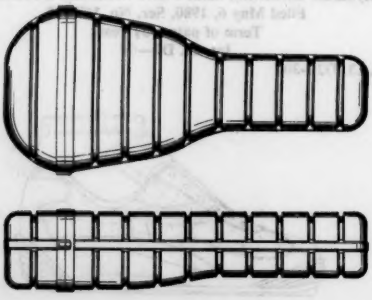
265,143
BRASSIERE
Toshiko Taniyama, White Plains, N.Y., assignor to International Playtex, Inc., Stamford, Conn.
Filed Jul. 18, 1980, Ser. No. 170,325
Term of patent 14 years
Int. Cl. D2—*01*
U.S. Cl. D2—24

265,144
SHOE
Christian Vermonet, Cholet, France, assignor to Societe Technisynthese (S.A.R.L.), Saint Pierre Montlimart, France
Filed May 6, 1980, Ser. No. 147,324
Term of patent 3½ years
Int. Cl. D2—*04*
U.S. Cl. D2—309

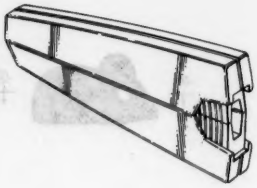


265,145
COLLAR CLIP OR THE LIKE
George E. Piorek, 1263 Thomas Ave., St. Paul, Minn. 55104
Filed Dec. 5, 1979, Ser. No. 100,450
Term of patent 14 years
Int. Cl. D2—*99*
U.S. Cl. D2—442

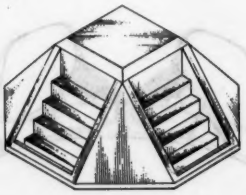
265,146
COVER FOR A MUSICAL INSTRUMENT CASE
Lance G. Rake, 358 S. Gay, Auburn, Ala. 36830, and Charles K. Collins, 11804 W. North Ave., Wauwatosa, Wis. 53226
Filed Mar. 20, 1980, Ser. No. 132,273
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D3—30.1



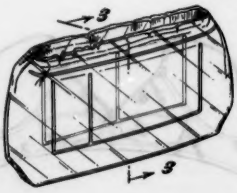
265,147
SCISSOR SCABBARD
Dennis B. Jackson, Nunawading, Australia, assignor to Wiltshire Consolidated Limited, South Melbourne, Australia
Filed May 8, 1980, Ser. No. 147,798
Claims priority, application Australia, Nov. 13, 1979, 79556
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D3—30.1



265,148
ROTATABLE CASSETTE TAPE STORAGE UNIT
Ronald W. Dwyhalo, 16736 Lahey St., Granada Hills, Calif. 91344
Continuation-in-part of Ser. No. 916,339, Jul. 10, 1978, abandoned. This application Jun. 26, 1980, Ser. No. 163,333
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D3—35



265,149
HAND BAG INSERT
Mary A. Romano, 13955 Coteau, Apt. 10, Whittier, Calif. 90604
Filed Nov. 6, 1979, Ser. No. 92,423
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D3—54



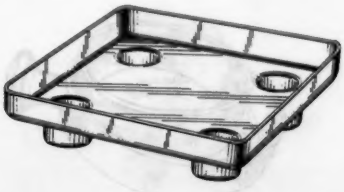
265,150
PLANT POT STAND
Maxwell E. Benedict, 6125 Shenandoah Dr., Sacramento, Calif. 95816
Filed May 15, 1980, Ser. No. 149,977
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—28

265,151
CHAIR OR SIMILAR ARTICLE
Ludwig Roner, Baden, Switzerland, assignor to Giroflex-Entwicklungs AG, Koblenz, Switzerland
Filed Oct. 15, 1979, Ser. No. 84,678
Claims priority, application Switzerland, Apr. 26, 1979, 68,710
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—78

265,152
TOY HOLDER FOR USE IN BATHTUBS, SHOWERS OR THE LIKE
Jenna Bruno, and Georgia Vance, both of 229 SE. 1st St., Moore, Okla. 73160
Filed Jun. 27, 1980, Ser. No. 163,871
Term of patent 14 years
Int. Cl. D2—*02*; D6—*04*
U.S. Cl. D6—86

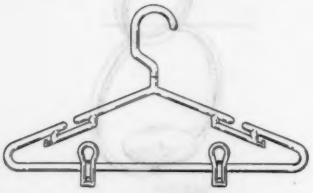
265,153
DESIGN FOR A HANGING SHELF
Richard F. Laurenzi, 278 Sterling Pl., Brooklyn, N.Y. 11238
Filed Jan. 28, 1980, Ser. No. 116,281
The portion of the term of this patent subsequent to Jun. 10, 1994, has been disclaimed.
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—113

265,154
PORTABLE TRAY TABLE FOR USE PRIMARILY ON A BOAT
Richard D. Cox, Oakland County, Mich., assignor to Nautical Engineering Division of R & D Enterprises, Northville, Mich.
Filed Sep. 20, 1979, Ser. No. 77,085
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—138



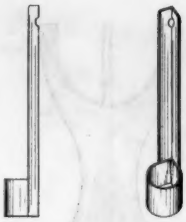
265,155
COMBINED DRESSER AND MIRROR UNIT
Anthony L. Bravo, Brea, Calif., assignor to Zeno Table Co., Inc., Santa Ana, Calif.
Filed Jul. 15, 1980, Ser. No. 169,222
Term of patent 14 years
Int. Cl. D06—*04*
U.S. Cl. D6—154

265,156
HANGER
Leonard Bisk, Elkins Park, and Gunther Rogahn, Lansdale, both of Pa., assignors to Independent Products Company, Inc., Lansdale, Pa.
Filed May 12, 1980, Ser. No. 148,896
Term of patent 14 years
Int. Cl. D6—*08*
U.S. Cl. D6—253

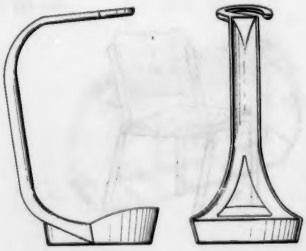


265,157
SOUP BOWL
Sharon K. A. McKeegan, 2016 Clinton, Alameda, Calif. 94501
Filed Sep. 29, 1977, Ser. No. 838,125
Term of patent 14 years
Int. Cl. D07—*01*
U.S. Cl. D7—20

265,158
SPAGHETTI PORTION MEASURER
Allen H. Green, II, 1211 Prince Edward St., Fredericksburg, Va. 22401
Filed Mar. 24, 1980, Ser. No. 133,583
Term of patent 14 years
Int. Cl. D10—*04*; D07—*04*
U.S. Cl. D7—50



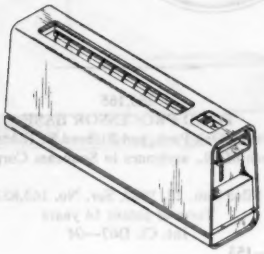
265,159
COMBINED BOTTLE HANDLE AND HOLDER
Mannie La Barbera, Chappaqua, N.Y., assignor to Coca-Cola Company, Atlanta, Ga.
Filed Jun. 6, 1980, Ser. No. 157,161
Term of patent 14 years
Int. Cl. D07—*99, 01*
U.S. Cl. D7—70

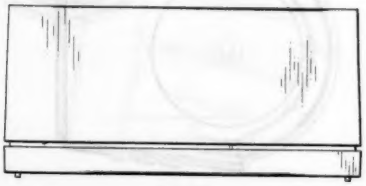


265,160
**TOASTER**

Craig B. Kelley, Wayne, Pa., assignor to SCM Corporation, New York, N.Y.

Filed Jul. 8, 1980, Ser. No. 167,085
Term of patent 14 years
Int. Cl. D07—*02*
U.S. Cl. D7—93

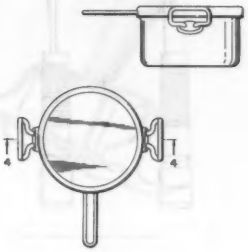




265,161
**COVERED COOKING POT OR SIMILAR ARTICLE**

Toshio Otake, Yoshida, Japan, assignor to Yoshikawa Metal Ware Kabushiki Kaisha, Japan

Filed Dec. 13, 1979, Ser. No. 103,296
Claims priority, application Japan, Jul. 10, 1979, 54-029009
Term of patent 14 years
Int. Cl. D07—*02*
U.S. Cl. D7—97

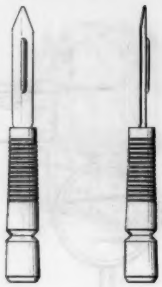


265,162
**BARBEQUE GRILL**

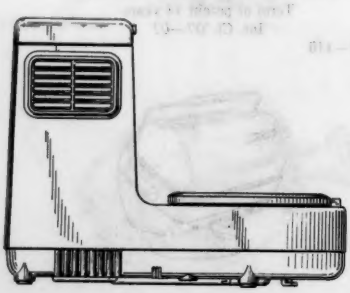
Emmett R. Bales, Morristown, Tenn., assignor to Metals Engineering Corporation, Greeneville, Tenn.

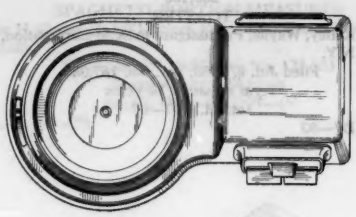
Filed Jul. 14, 1980, Ser. No. 168,586
Term of patent 14 years
Int. Cl. D07—*02*
U.S. Cl. D7—110

265,163
PEELER
Fred S. Steiner, 154 Combs Ave., Woodmere, N.Y. 11598
Filed Jul. 10, 1980, Ser. No. 168,434
Term of patent 14 years
Int. Cl. D07—*04*
U.S. Cl. D7—147

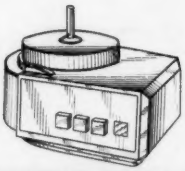


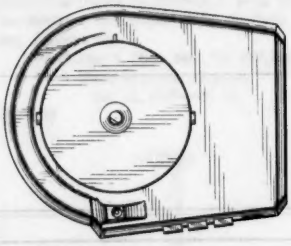
265,164
APPLIANCE-DRIVING UNIT FOR A FOOD-PROCESSING APPLIANCE
Robert O. Ernest, Oak Park, and Bernard B. Bluestein, Des Plaines, both of Ill., assignors to Sunbeam Corporation, Chicago, Ill.
Filed Jul. 11, 1980, Ser. No. 167,497
Term of patent 14 years
Int. Cl. D07—*04*
U.S. Cl. D7—153



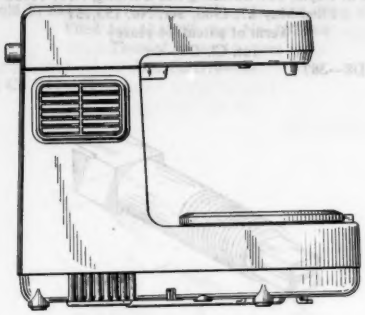


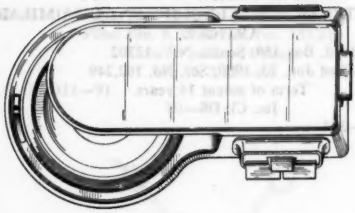
265,165
FOOD PROCESSOR BASE
Robert O. Ernest, Oak Park, and Richard K. Thomas, Elk Grove Village, both of Ill., assignors to Sunbeam Corporation, Chicago, Ill.
Filed Jun. 27, 1980, Ser. No. 163,833
Term of patent 14 years
Int. Cl. D07—*04*
U.S. Cl. D7—153



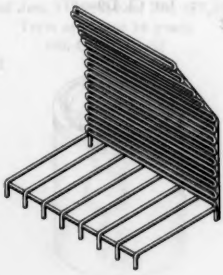


265,166
FOOD-MIXING APPARATUS
Robert O. Ernest, Oak Park, and Bernard B. Bluestein, Des Plaines, both of Ill., assignors to Sunbeam Corporation, Chicago, Ill.
Filed Jul. 11, 1980, Ser. No. 167,626
Term of patent 14 years
Int. Cl. D07—*04*
U.S. Cl. D7—159

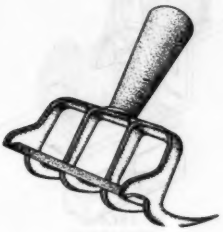




265,167
COMBINED GRATE AND WATER HEATER INSERT FOR WOOD BURNING FIREPLACE
Adolph Cordova, 1249 43rd Ave., Sacramento, Calif. 95822
Filed Jul. 31, 1980, Ser. No. 173,986
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D7—207

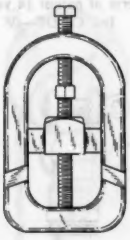


265,168
COMBINATION CUTTER AND CULTIVATOR TOOL HEAD
Ron Zabarte, 1757 Tice Valley Blvd., Walnut Creek, Calif. 94595
Filed Apr. 7, 1980, Ser. No. 138,506
Term of patent 14 years
Int. Cl. D8—*99*
U.S. Cl. D8—06

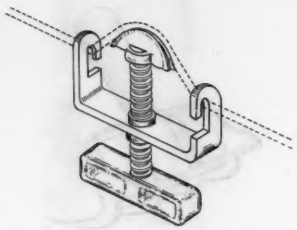


265,169
SNOW REMOVAL TOOL
Donald E. Bunnell, 1103-3rd St. NE., and Eldor A. Kintzi, 813-1st St. SE., both of Belmond, Iowa 50421
Filed Apr. 11, 1980, Ser. No. 139,466
Term of patent 14 years
Int. Cl. D8—*01*
U.S. Cl. D8—10

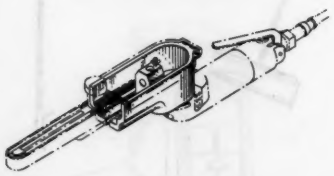
265,170
HEAVY DUTY LINE TIGHTENER
Robert C. Zukaitis, 7192 Mohawk Trail, Yucca Valley, Calif. 92284
Filed Jul. 21, 1980, Ser. No. 172,223
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—44



265,171
LINE TIGHTENER
Robert C. Zukaitis, 7192 Mohawk Trail, Yucca Valley, Calif. 92284
Filed Jul. 21, 1980, Ser. No. 172,461
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—44

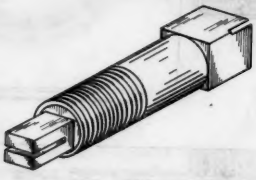


265,172
CASING FOR A PORTABLE BELT GRINDER
Elwin H. Fleckenstein, Alden, and Walter N. Welsch, Tonawanda, both of N.Y., assignors to Dynabrade, Inc., Tonawanda, N.Y.
Filed Apr. 16, 1980, Ser. No. 140,845
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—62



265,173
ROPE SHACKLE
Kenneth Brooks, 469 S. Delaware Ave., Lindenhurst, N.Y. 11757
Filed May 16, 1980, Ser. No. 150,314
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—356

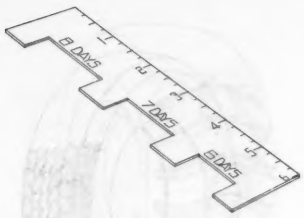
265,174
EYEGLASS TEMPLE SCREW OR THE LIKE
Raymond J. Boyle, 244 Chemung St., Corning, N.Y. 14830
Filed May 27, 1980, Ser. No. 153,151
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—387



265,175
STRAP FASTENER FOR SKI EQUIPMENT OR SIMILAR ARTICLE
Edward A. Lloyd, Box 158, Scotia, N.Y. 12302
Filed Jun. 23, 1980, Ser. No. 162,249
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—394

265,176
PACKING DRUM
Erik Bock, Kirke Hyllinge, Denmark, assignor to Superfos Emballage A/S, Vipperod, Denmark
Filed Dec. 22, 1978, Ser. No. 972,418
Claims priority, application Denmark, Jun. 23, 1978, 495
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—352

265,177
AID FOR THE ADDITION OF COLUMNAR ARRANGED DRIVING HOURS
Harold E. Skinner, 2744 Kismet Way, Eugene, Oreg. 97405
Filed Jul. 11, 1980, Ser. No. 167,664
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—64




265,178
PENDANT SETTING FOR GEMS
Robert G. Musillo, 5481 Wolf Dr., Pittsburgh, Pa. 15236
Filed Jun. 9, 1980, Ser. No. 157,316
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—91

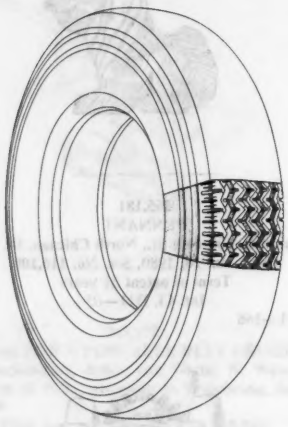
265,179
PENDANT SETTING FOR GEMS
Robert G. Musillo, 5481 Wolf Dr., Pittsburgh, Pa. 15236
Filed Jun. 9, 1980, Ser. No. 157,317
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—91

265,180
FIGURINE OF A GERMAN SHEPHERD PUP
Jesus A. Carvajales Santa-Eulalia, and Javier B. Carvajales Santa-Eulalia, both of Montevideo, Uruguay, assignors to John J. Madison Company, Inc., Laguna Hills, Calif.
Filed Mar. 31, 1980, Ser. No. 135,454
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—158

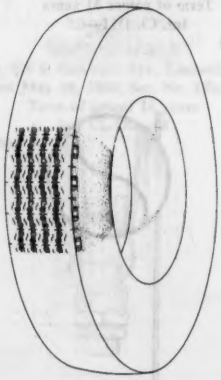
265,181
PENNANT
Larry B. Ornatek, 100-14th St., North Chicago, Ill. 60064
Filed Jan. 28, 1980, Ser. No. 116,108
Term of patent 3½ years
Int. Cl. D11—*05*
U.S. Cl. D11—166

265,182
PENNANT
Larry B. Ornatek, 100-14th St., North Chicago, Ill. 60064
Filed Mar. 13, 1980, Ser. No. 116,265
Term of patent 3½ years
Int. Cl. D11—*05*
U.S. Cl. D11—166

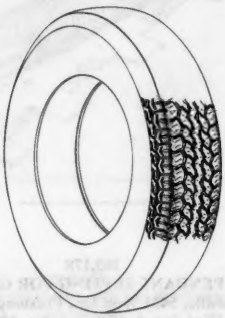
265,183
TIRE
Guy Amarger, Clermont-Ferrand, France, assignor to Compagnie Generale des Etablissements Michelin, Clermont-Ferrand, France
Filed Jul. 25, 1980, Ser. No. 172,189
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—143



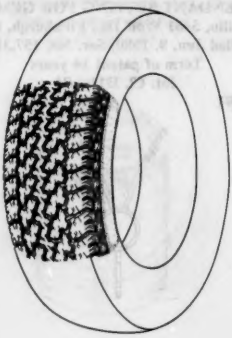
265,184
TIRE
Philip S. Hammond, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio
Filed Oct. 14, 1980, Ser. No. 195,956
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—143



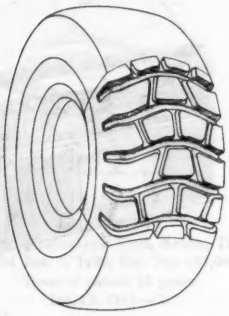
265,185
VEHICLE TIRE
Hubert Grohmann, Gislaved; Kent-Ove Holmen, Smalandsstenar, and Halvard Nilsson, Gislaved, all of Sweden, assignors to Gislaved Aktiebolag, Gislaved, Sweden
Filed Sep. 9, 1980, Ser. No. 185,614
Claims priority, application Sweden, Mar. 10, 1980, 80486
Term of patent 7 years
Int. Cl. D12—*15*
U.S. Cl. D12—146



265,186
TIRE
Warren T. Karlyn, Cuyahoga Falls, and Daniel J. Lindner, Canal Fulton, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio
Filed Jul. 21, 1980, Ser. No. 170,417
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—147

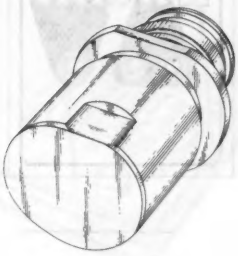


265,187
TIRE
Antoine Raluy, Bouzel, France, assignor to Compagnie Generale des Etablissements Michelin, Clermont-Ferrand, France
Filed Jun. 12, 1980, Ser. No. 158,723
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—149

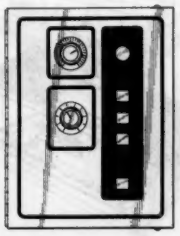


265,188
VEHICLE WHEEL
Donald J. Reid, Pleasant Ridge, Mich., assignor to Kelsey-Hayes Co., Romulus, Mich.
Filed Jan. 25, 1980, Ser. No. 115,320
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—211

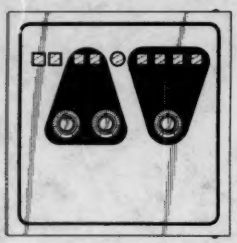
265,189
CODE PLUG FOR A RAILWAY SIGNAL BEACON
Sven G. Eriksson, Grabo, and Bo A. Morwing, Lindome, both of Sweden, assignors to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden
Filed Jun. 5, 1979, Ser. No. 45,760
Claims priority, application Sweden, Dec. 11, 1978, 78002904
Term of patent 14 years
Int. Cl.[3] D13—*03*
U.S. Cl. D13—12



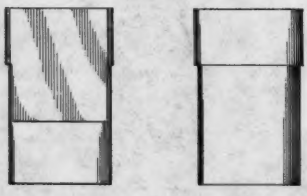
265,190
CONTROL UNIT
Hoy R. Bohanon, Sr., Muskogee, Okla., assignor to Acme Engineering & Manufacturing Corporation, Muskogee, Okla.
Filed Jun. 25, 1980, Ser. No. 162,924
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—12



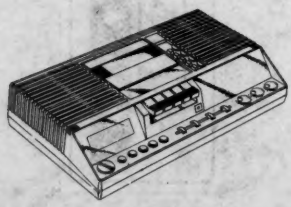
265,191
CONTROL UNIT
Roy R. Bohanon, Sr., Muskogee, Okla., assignor to Acme Engineering & Manufacturing Corporation, Muskogee, Okla.
Filed Jul. 7, 1980, Ser. No. 166,369
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—12



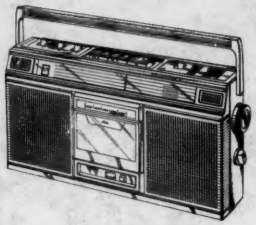
265,192
RESET BUTTON EXTENDER FOR COMPUTERS OR THE LIKE
Peter E. Noeth, Jr., 1405 Phelps #2, San Jose, Calif. 95117
Filed May 9, 1980, Ser. No. 149,238
Term of patent 14 years
Int. Cl. D13—*03;* D14—*02*
U.S. Cl. D13—38



265,193
COMBINED CLOCK RADIO AND CASSETTE PLAYER
Pak T. Fung, Hong Kong, Hong Kong, assignor to Baro Far East Limited, Hong Kong, Hong Kong
Filed Jan. 22, 1980, Ser. No. 114,314
Claims priority, application United Kingdom, Jul. 23, 1979, 990847
Term of patent 14 years
Int. Cl. D14—*01, 03;* D10—*01*
U.S. Cl. D14—5



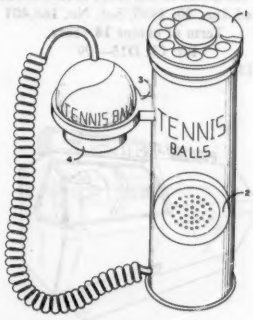
265,194
COMBINED RADIO RECEIVER AND TAPE RECORDER
Katsutoshi Kido, Kyoto, and Satoru Usami, Hirakata, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Sep. 30, 1980, Ser. No. 192,403
Claims priority, application Japan, Apr. 2, 1980, 55-13165
Term of patent 14 years
Int. Cl. D14—*01, 03*
U.S. Cl. D14—5



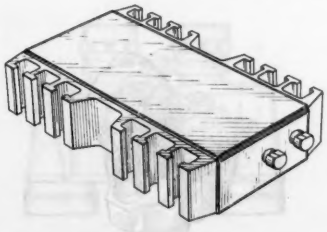
265,195
MAGNETIC TAPE CASSETTE
Willem A. Slingerland, Vught, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.
Continuation of Ser. No. 828,178, Aug. 26, 1977, abandoned, and a continuation of Ser. No. 828,179, Aug. 26, 1977, abandoned.
This application Jun. 4, 1979, Ser. No. 45,574
Claims priority, application Benelux, Mar. 2, 1977, 51705-02
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—11

265,196
RECORD PLAYER
Katsuya Matsumura, Osaka, Japan, assignor to Sharp Corporation, Osaka, Japan
Filed Aug. 16, 1979, Ser. No. 62,250
Claims priority, application Japan, Jan. 29, 1979, 54/3288
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—14

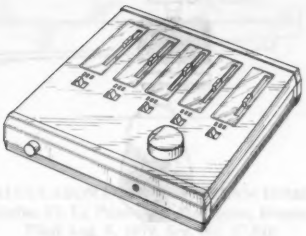
265,197
TELEPHONE
Clifford R. Jones, 307 Buckeye Trail, Austin, Tex. 78746
Filed Jun. 9, 1980, Ser. No. 157,964
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—53



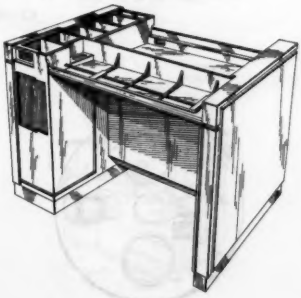

265,198
ELECTRONIC POWER AMPLIFIER
Hari Matsuda, Skokie, Ill., assignor to International Jensen Incorporated, Schiller Park, Ill.
Filed May 13, 1980, Ser. No. 149,454
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—96



265,199
ELECTRONIC GRAPHIC EQUALIZER OR THE LIKE
Keith F. Urban, Elk Grove Village, and Hari Matsuda, Skokie, both of Ill., assignors to International Jensen Incorporated, Schiller Park, Ill.
Filed May 13, 1980, Ser. No. 149,455
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—96

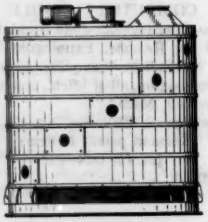


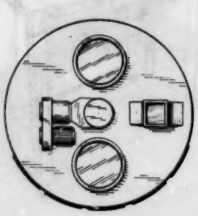
265,200
COMPUTER CONSOLE
John H. Pedersen, Birmingham; John Stencel, Jr., Bloomfield Hills; Richard W. Reaume, Farmington Hills; Robert T. Rourke, Troy; Michael N. Tranquilla, Livonia, and Michael A. Saunders, Farmington, all of Mich., assignors to Burroughs Corporation, Detroit, Mich.
Filed Apr. 2, 1980, Ser. No. 136,743
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D14—103



265,201
GLASSWASHER
Henry A. Salem, Lynnfield, Mass., assignor to Brite Way Corporation, Woburn, Mass.
Filed Nov. 30, 1979, Ser. No. 98,950
Term of patent 14 years
Int. Cl. D15—*05*
U.S. Cl. D32—2

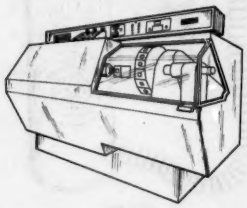
265,202
ROTARY REFRIGERATOR FOR THE COOLING OF FODDER PILLS MADE BY A PILL PRESS
Flemming J. Thomsen, Odense, Denmark, assignor to Nordivan Engineering Aps, Denmark
Filed Feb. 25, 1980, Ser. No. 124,073
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D15—79



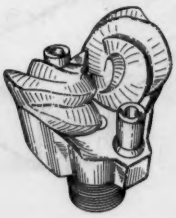


265,203
SANITARY MACHINE FOR STORING AND DISPENSING PARTICULATE ICE
Charles M. Lents, Leon Valley, Tex., assignor to Stainless Ice-Tainer Company, San Antonio, Tex.
Filed Jun. 2, 1980, Ser. No. 155,326
Term of patent 14 years
Int. Cl. D15—*07*
U.S. Cl. D15—80

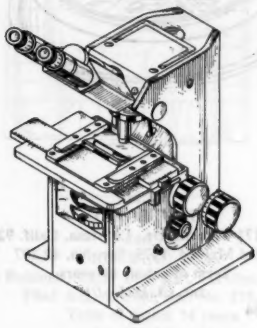
265,204
NUMERICALLY CONTROLLED LATHE
Manuel C. Turchan, Dearborn, Mich., and Harry D. Mackie, Palatine, Ill., assignors to Turchan, Inc., Dearborn, Mich.
Filed Jun. 30, 1980, Ser. No. 164,401
Term of patent 14 years
Int. Cl. D15—*09*
U.S. Cl. D15—130



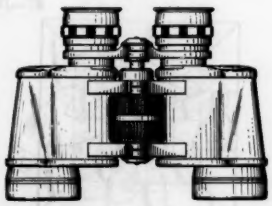
265,205
DRILL BIT
Beaufort E. Munson, 1002 Yale, Butte, Mont. 59701
Filed Apr. 24, 1980, Ser. No. 143,502
Term of patent 14 years
Int. Cl. D15—*09*
U.S. Cl. D15—139



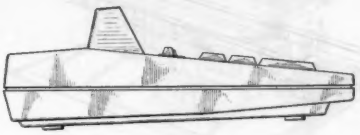
265,206
COMPACT MICROSCOPE
Klaus Weber, Köngisbronn, and Erich Stütz, Aalen, both of Fed. Rep. of Germany, assignors to Carl Zeiss-Stiftung, Oberkochen, Fed. Rep. of Germany
Filed Apr. 2, 1980, Ser. No. 136,549
Claims priority, application Fed. Rep. of Germany, Oct. 2, 1979, GR I 2467/79
Term of patent 14 years
Int. Cl. D16—*06*
U.S. Cl. D16—131



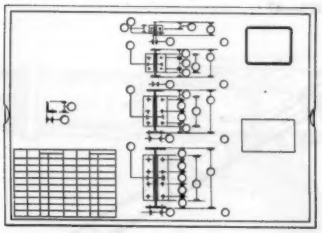
265,207
PAIR OF BINOCULARS OR SIMILAR ARTICLE
George Rosenfield, Coral Gables, and Richard L. Korte, Miami, both of Fla., assignors to Tasco Sales, Inc., Miami, Fla.
Filed Aug. 1, 1978, Ser. No. 930,109
Term of patent 14 years
Int. Cl. D16—*06*
U.S. Cl. D16—133



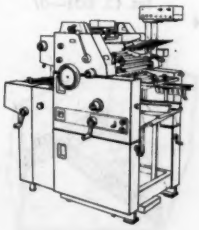
265,208
CALCULATOR
Robert T. Faranda, Boonton, and Stuart D. Leer, Budd Lake, both of N.J., assignors to Litton Business Systems, Inc., Morris Plains, N.J.
Filed Oct. 29, 1979, Ser. No. 89,598
Term of patent 14 years
Int. Cl. D18—*01*
U.S. Cl. D18—7



265,209
SLIDE CALCULATOR FOR METAL BEAM DIMENSIONS
Francois Aiello, 32, Le Panorama, Martigues, France
Filed Aug. 8, 1979, Ser. No. 37,910
Term of patent 14 years
Int. Cl. D18—*99*
U.S. Cl. D18—9

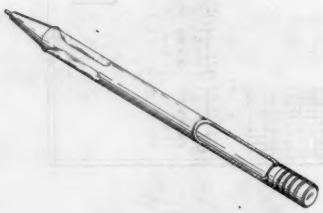


265,210
PRINTING MACHINE
Etsuo Hitaishi, Hiroshima, and Takeshi Shohoji, Fukuyama, both of Japan, assignors to Ryobi, Ltd., Hiroshima, Japan
Filed Jul. 16, 1980, Ser. No. 169,244
Term of patent 14 years
Int. Cl. D18—*02*
U.S. Cl. D18—13

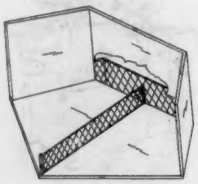


265,211
SCRIBING RULE GUIDE OR SIMILAR ARTICLE
Joseph L. Knight, P.O. Box 150, Knox, Pa. 16232
Filed Jun. 21, 1979, Ser. No. 50,815
Term of patent 14 years
Int. Cl. D19—*99*
U.S. Cl. D19—35

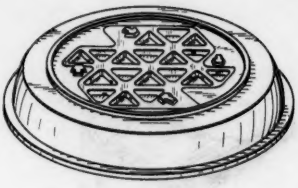
265,212
BALLPOINT PEN
Bernt Spiegel, Edingen, Fed. Rep. of Germany, assignor to C. Josef Lamy GmbH, Fed. Rep. of Germany
Filed Aug. 25, 1980, Ser. No. 181,204
Claims priority, application Fed. Rep. of Germany, Feb. 29, 1980, G 30
Term of patent 14 years
Int. Cl. D19—*06*
U.S. Cl. D19—47



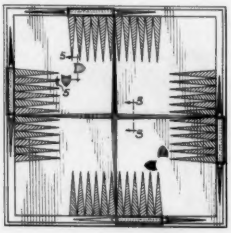
265,213
TABLE BAT AND BALL GAME DEVICE
Michael A. Spalding, 1540 McKinley Ave., Huntsville, Ala. 35801
Filed Feb. 11, 1980, Ser. No. 120,280
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—14



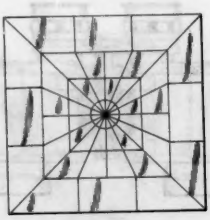
265,214
GAME BOARD
Leonard H. Israel, 817 20th St., Apt. 103-S, Santa Monica, Calif. 90403, and Perry J. Grant, 727 Ocampo Dr., Pacific Palisades, Calif. 90272
Filed Feb. 19, 1980, Ser. No. 122,268
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—17



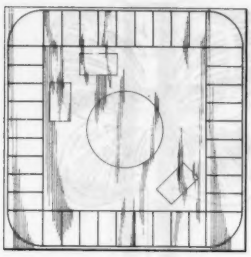
265,215
GAMEBOARD
Jacob Rosen, 8171 Vincetta Dr., La Mesa, Calif. 92041
Filed May 24, 1979, Ser. No. 42,207
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—34



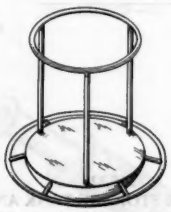
265,216
GAME BOARD
Bobby J. Tammen, Rte. 2 - Box 233, Colorado City, Tex. 79512
Filed Jul. 28, 1980, Ser. No. 173,089
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—34



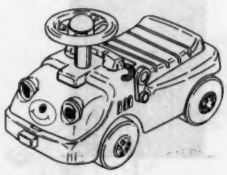
265,217
GAME BOARD
Ronald Craig, and Susan Craig, both of South Indian Lake, Canada, assignors to Boodjie Enterprises Ltd., Winnipeg, Canada
Filed Jan. 9, 1980, Ser. No. 110,799
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—35



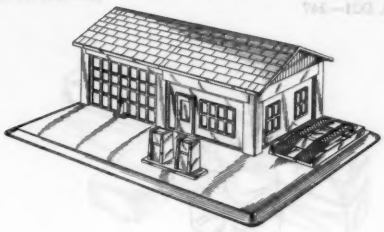
265,218
ROCKING TOY
Donald C. Robinett, 19427 Leal Cir., Cerritos, Calif. 90701
Filed Aug. 4, 1980, Ser. No. 175,304
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—66



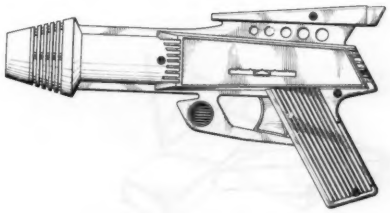
265,219
TOY VEHICLE
Kenzou Kassai, Osaka, Japan, assignor to Kassai Kabushikikaisha, Osaka, Japan
Filed Apr. 11, 1979, Ser. No. 29,071
Claims priority, application Japan, Oct. 11, 1978, 53-43286
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—78



265,220
TOY GARAGE
Henry Orenstein, 136 Lakeside Ave., Verona, N.J. 07044
Filed Jul. 7, 1980, Ser. No. 165,860
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—118



265,221
TOY GUN
Charles H. Hardin, Nashville, Tenn., assignor to Kusan, Inc., Nashville, Tenn.
Filed Sep. 7, 1979, Ser. No. 73,442
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—147



265,222
NOISE MAKER ATTACHMENT FOR ROLLER SKATES
Ronald D. Kay, Fort Worth, Tex., assignor to John H. Sparks Property Services, Inc., Fort Worth, Tex.
Filed Jan. 4, 1980, Ser. No. 109,475
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—226

265,223

SPRING MOUNTED RIDING TOY

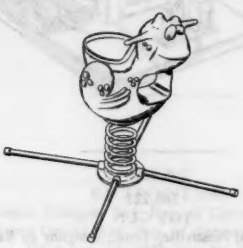
Roger J. Bollen, Willoughby Hills; William A. Erdos, Peninsula, and Roger H. Ramsey, Akron, all of Ohio, assignors to Eagle Rubber Co., Inc., Ashland, Ohio

Filed Jun. 30, 1980, Ser. No. 164,896

Term of patent 14 years

Int. Cl. D21—*03*

U.S. Cl. D21—247



265,224

SPRING MOUNTED RIDING TOY

Roger J. Bollen, Willoughby Hills; William A. Erdos, Peninsula, and Roger H. Ramsey, Akron, all of Ohio, assignors to Eagle Rubber Co., Inc., Ashland, Ohio

Filed Jun. 30, 1980, Ser. No. 164,897

Term of patent 14 years

Int. Cl. D21—*03*

U.S. Cl. D21—247

265,225

FLY SWATTER

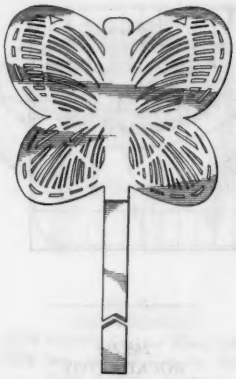
Harry S. Oakes, 573 Smithbridge Rd., Glen Mills, Pa. 19342

Filed Nov. 2, 1979, Ser. No. 90,651

Term of patent 14 years

Int. Cl. D22—*06*

U.S. Cl. D22—20



265,226

COMBINED WATER STORAGE TANK AND BUILDING

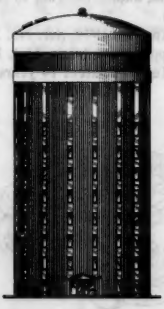
J. Keith Carlat, and John O. Cliff, both of Franklin, Tenn., assignors to Pittsburgh-Des Moines Corporation, Pittsburgh, Pa.

Filed Jun. 3, 1980, Ser. No. 156,251

Term of patent 14 years

Int. Cl. D23—*01*; D25—*03*

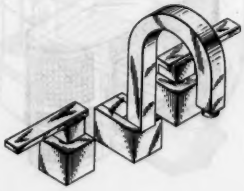
U.S. Cl. D23—2



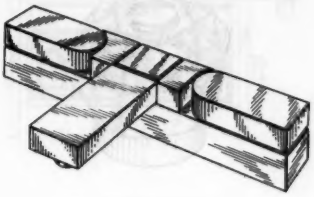
265,227
WATER PURIFICATION UNIT
F. Carlton Jolley, 68C Federal Rd., Englishtown, N.J. 07726
Filed Mar. 17, 1980, Ser. No. 131,244
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—3

265,228
FLUSH VALVE CLOSER
James H. Jenkins, 6010 N. 26th St., Arlington, Va. 22207
Filed Apr. 10, 1980, Ser. No. 138,890
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—19

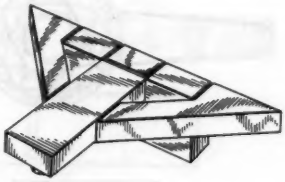
265,229
FAUCET SET
Stanley M. Paul, Rye, N.Y., assignor to Paul Associates, Inc., New York, N.Y.
Filed Jun. 17, 1980, Ser. No. 160,352
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—25



265,230
FAUCET SET
Stanley M. Paul, Rye, N.Y., assignor to Paul Associates, Inc., New York, N.Y.
Filed Jun. 17, 1980, Ser. No. 160,353
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—25

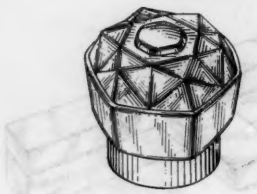


265,231
FAUCET SET
Stanley M. Paul, Rye, N.Y., assignor to Paul Associates, Inc., New York, N.Y.
Filed Jun. 17, 1980, Ser. No. 160,398
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—25

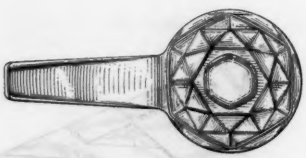


265,232
LENS FOR FAUCET HANDLE AND THE LIKE
John P. Ronvik, Palos Heights, Ill., assignor to Sears, Roebuck and Co., Chicago, Ill.
Filed Jun. 6, 1980, Ser. No. 157,121
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—28

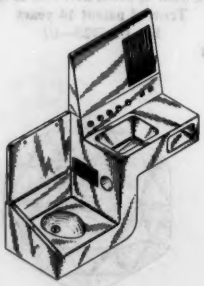
265,233
FAUCET HANDLE AND THE LIKE
John P. Ronvik, Palos Heights, Ill., assignor to Sears, Roebuck and Co., Chicago, Ill.
Filed Jun. 6, 1980, Ser. No. 157,122
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—28



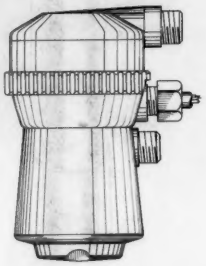
265,234
FAUCET HANDLE AND THE LIKE
John P. Ronvik, Palos Heights, Ill., assignor to Sears, Roebuck and Co., Chicago, Ill.
Filed Jun. 6, 1980, Ser. No. 157,123
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—29



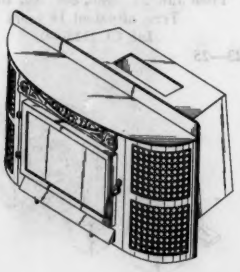
265,235
COMBINED WATER CLOSET AND LAVATORY
Ernest Keller, 605 Water St., New York, N.Y. 10002
Filed Mar. 14, 1980, Ser. No. 130,549
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—49



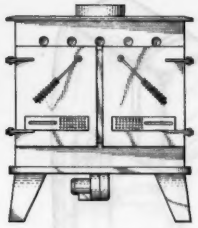
265,236
ELECTRIC WATER HEATER
Amilcar F. Yamin, Sao Paulo, Brazil, assignor to Produtos Eletricos Corona Ltda., Guarulhos, Brazil
Filed Apr. 23, 1979, Ser. No. 32,216
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—88



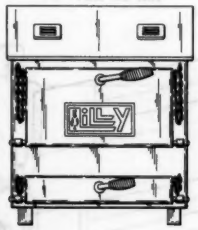
265,237
FIREPLACE INSERT
Donald Beck; Hugh N. Johnson, both of North Vancouver, and Haydn Jones, Burnaby, all of Canada, assignors to M.G.F. Distributors Ltd., North Vancouver, Canada
Filed Jun. 30, 1980, Ser. No. 164,201
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—94



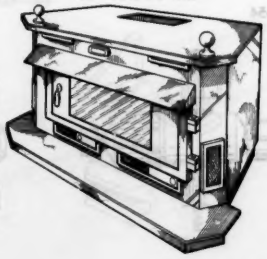
265,238
STOVE
Jesse C. Anderson, Box 76, Salina, Utah 84654
Filed Jul. 25, 1980, Ser. No. 172,410
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—97



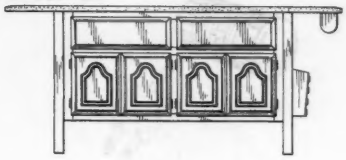
265,239
STOVE
Wilbur E. Lilly, Rte. 2, Mt. Gilead, Ohio 43338
Filed Sep. 8, 1980, Ser. No. 184,937
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—97



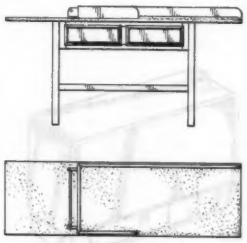

265,240
STOVE
Charles W. Kooles, Enka, N.C., assignor to Energetics Mfg. Co., Arden, N.C.
Filed Sep. 15, 1980, Ser. No. 187,211
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—97



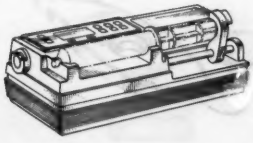
265,241
EXAMINING TABLE
Donald R. Patterson, 2509 Jackson, Joplin, Mo. 64801
Filed Apr. 4, 1980, Ser. No. 137,119
Term of patent 14 years
Int. Cl. D24—*01*
U.S. Cl. D24—03



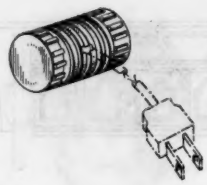
265,242
EXAMINING TABLE
Donald R. Patterson, 2509 Jackson, Joplin, Mo. 64801
Filed Apr. 4, 1980, Ser. No. 137,120
Term of patent 14 years
Int. Cl. D24—*01*
U.S. Cl. D24—03



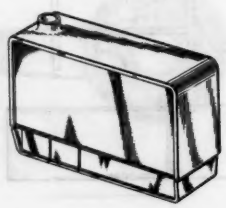
265,243
FLUID DELIVERY APPARATUS
Joseph J. Manno; William W. Busche, both of San Diego; Richard M. Bucchianeri, Escondido, and Stephen J. Kreinick, San Diego, all of Calif., assignors to IVAC Corporation, San Diego, Calif.
Filed Dec. 15, 1980, Ser. No. 216,634
Term of patent 14 years
Int. Cl. D24—*01*
U.S. Cl. D24—8



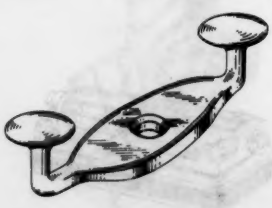
265,244
CONTACT LENS STERILIZER UNIT CASING
Francis E. Ryder, Arab, Ala., assignor to Ryder International Corporation, Arab, Ala.
Filed Mar. 13, 1980, Ser. No. 130,207
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—9



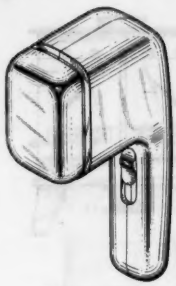
265,245
MOTOR HOUSING FOR AN ORAL HYGIENE APPLIANCE
Ted G. Crawford, Longmont, Colo.; Allan B. Johnson, Tarzana, and Spencer L. Mackay, Canoga Park, both of Calif., assignors to Teledyne Industries, Inc., Ft. Collins, Colo.
Filed May 27, 1980, Ser. No. 153,193
Term of patent 14 years
Int. Cl. D24—*03*
U.S. Cl. D24—15



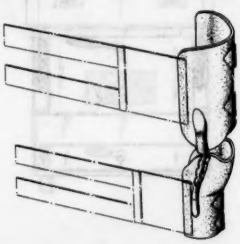
265,246
DENTURE RETAINER IMPLANT
Arthur C. Jermyn, Poway, Calif., assignor to Young Dental Mfg. Co., Inc., Maryland Heights, Mo.
Filed Apr. 10, 1980, Ser. No. 139,150
Term of patent 14 years
Int. Cl. D24—*03*
U.S. Cl. D24—33



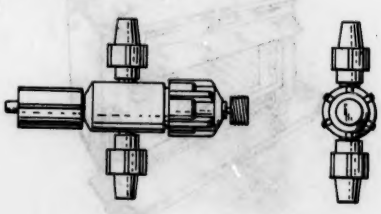
265,247
MASSAGER
Francis W. MacGregor, New Britain, Conn., assignor to Clairol Incorporated, New York, N.Y.
Filed Sep. 26, 1979, Ser. No. 79,149
Term of patent 14 years
Int. Cl. D28—*03*; D24—*99*
U.S. Cl. D24—41



265,248
POST OPERATIVE KNEE ORTHOSIS
Paul P. Grigorieff, 233 Calle de la Selva, Novato, Calif. 94947
Filed Dec. 17, 1979, Ser. No. 104,141
Term of patent 14 years
Int. Cl. D24—*99*
U.S. Cl. D24—49



265,249
FITTING ASSEMBLY FOR GUIDING AND RESTRAINING A PROBE IN A CATHETER
Kenneth Halvorsen, Huntington Beach, Calif., assignor to Medical Testing Systems, Inc., Fountain Valley, Calif.
Filed Apr. 7, 1980, Ser. No. 137,726
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. 24—54

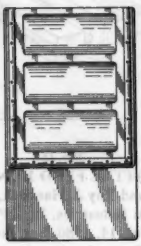


265,250

**STAIR FOR A SWIMMING POOL**

Ronald C. Wallin, and Wesley A. Wallin, both of 132 Federal Rd., Danbury, Conn. 06810

Filed May 19, 1980, Ser. No. 151,526
Term of patent 14 years
Int. Cl. D25—*02*
U.S. Cl. D25—63

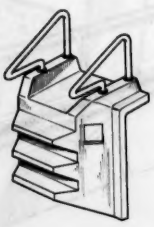


265,251

**SWIMMING POOL LADDER**

James W. Darby, 2117 Smith, and David L. Darby, 501 Brickyard Rd., both of Danville, Ill. 61832

Filed Jul. 24, 1980, Ser. No. 171,749
Term of patent 14 years
Int. Cl. D25—*02*
U.S. Cl. D25—64

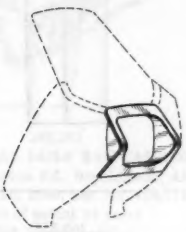


265,252

**HEADLIGHT BEZEL FOR MOTORCYCLE FAIRING**

David S. McNaughton, Morro Bay; Stephen C. Bern; Kenneth W. Cummings, both of San Luis Obispo, and Charles M. Perethian, Arroyo Grande, all of Calif., assignors to First Champaign Corporation, Rantoul, Ill.

Filed May 12, 1980, Ser. No. 149,298
Term of patent 14 years
Int. Cl. D26—*06*; D12—*11*
U.S. Cl. D26—139



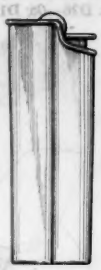
265,253

**PIPE STAND**

Theodore O. Barberry, Jr., and Susan J. Barberry, both of 4900 Wetheredsville Rd., Baltimore, Md. 21207

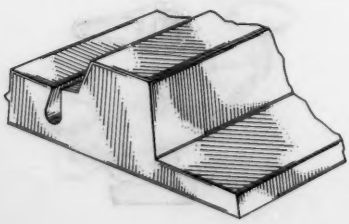
Filed Mar. 3, 1980, Ser. No. 127,258
Term of patent 7 years
Int. Cl. D27—*99*
U.S. Cl. D27—06

265,254
CIGARETTE LIGHTER
Dieter Rams, Kronberg, Fed. Rep. of Germany, assignor to The Gillette Company, Boston, Mass.
Filed Jun. 9, 1980, Ser. No. 157,710
Term of patent 14 years
Int. Cl. D27—*05*
U.S. Cl. D27—42

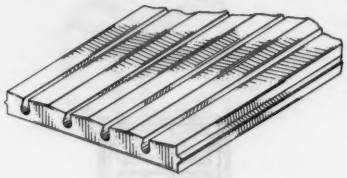


265,255
LOTION APPLICATOR
LaVerta M. O'Neil, 2944 E. Fairmont, Apartment No. 238-F, Phoenix, Ariz. 85016
Filed May 19, 1980, Ser. No. 151,313
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—7

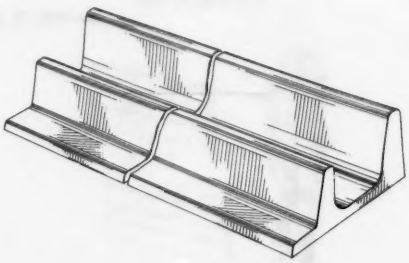
265,256
CURB FOR ANIMAL CONFINEMENT PENS
Richard E. Bunger, and Roy J. Hancock, both of Phoenix, Ariz., assignors to Corral Industries, Inc., Phoenix, Ariz.
Filed Jul. 14, 1980, Ser. No. 168,116
Term of patent 14 years
Int. Cl. D30—*02*
U.S. Cl. D30—2



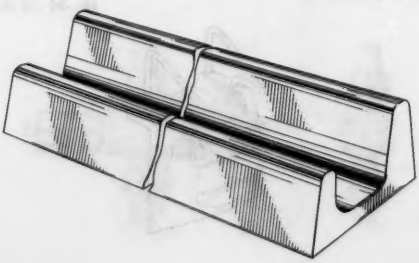
265,257
INTERLOCKING FLUME PLATFORM PANEL FOR ANIMAL CONFINEMENT PENS
Richard E. Bunger, and Roy J. Hancock, both of Phoenix, Ariz., assignors to Corral Industries, Inc., Phoenix, Ariz.
Filed Jul. 14, 1980, Ser. No. 168,119
Term of patent 14 years
Int. Cl. D30—*02*
U.S. Cl. D30—2



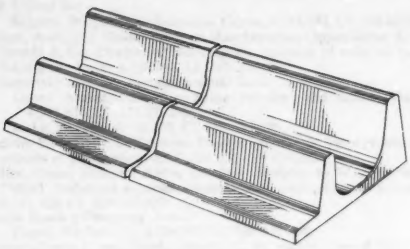
265,258
CATTLE FEED BUNKER
Richard E. Bunger, and Roy J. Hancock, both of Phoenix, Ariz., assignors to Corral Industries, Inc., Phoenix, Ariz.
Filed Jul. 14, 1980, Ser. No. 168,120
Term of patent 14 years
Int. Cl. D30—*03*
U.S. Cl. D30—13



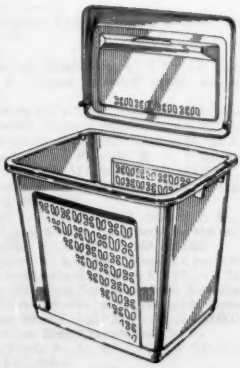
265,259
CATTLE FEED BUNKER
Richard E. Bunger, and Roy J. Hancock, both of Phoenix, Ariz., assignors to Corral Industries, Inc., Phoenix, Ariz.
Filed Jul. 14, 1980, Ser. No. 168,557
Term of patent 14 years
Int. Cl. D30—*03*
U.S. Cl. D30—13



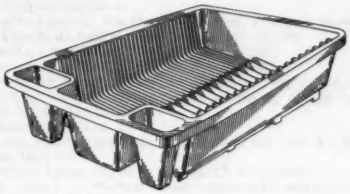
265,260
CATTLE FEED BUNKER
Richard E. Bunger, and Roy J. Hancock, both of Phoenix, Ariz., assignors to Corral Industries, Inc., Phoenix, Ariz.
Filed Jul. 14, 1980, Ser. No. 168,558
Term of patent 14 years
Int. Cl. D30—*03*
U.S. Cl. D30—13



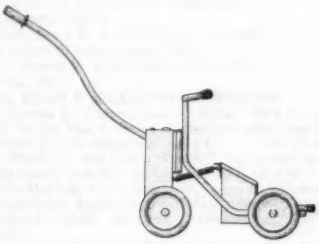
265,261
CLOTHES HAMPER
William C. Gerber, Wooster, Ohio, assignor to Rubbermaid Incorporated, Wooster, Ohio
Filed Jul. 11, 1980, Ser. No. 167,683
Term of patent 14 years
Int. Cl. D7—*07*
U.S. Cl. D32—37



265,262
MOLDED PLASTIC DISH DRAINER
William D. Taylor, Wooster, Ohio, assignor to Rubbermaid Incorporated, Wooster, Ohio
Filed Jun. 19, 1980, Ser. No. 160,922
Term of patent 14 years
Int. Cl. D7—*05*
U.S. Cl. D32—55



265,263
ELECTRICAL GOLF BAG CARRIER
Joseph H. Fox, 8 Clarendon Rd., Birmingham, Ala. 35213
Filed Jun. 16, 1980, Ser. No. 159,771
Term of patent 14 years
Int. Cl. D12—*02*
U.S. Cl. D34—15



265,264
MAILBOX
Chan-Jong Yeh, 3358 Tryna Dr., Mountain View, Calif. 94040
Filed May 19, 1980, Ser. No. 151,746
Term of patent 14 years
Int. Cl. D25—*02*
U.S. Cl. D99—33

# LIST OF PATENTEES

TO WHOM

## PATENTS WERE ISSUED ON THE 29TH DAY OF JUNE, 1982

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A-Betong AB: *See*—
Limmergard, Sten, 4,336,906, Cl. 238-8.000.

AB Svenska Flaktfabriken: *See*—
Ellestad, Arne; and Tokerud, Arvid, 4,337,230, Cl. 423-242.000.

AB Volvo: *See*—
Schultz, Bengt I.; and Svensson, Goran, 4,336,957, Cl. 280-803.000.

Adam, Axel; and Heina, Fritz, to Maschinenbau Oppenweiler Binder GmbH & Co. Device for reducing the emission of noise in buckle folding machines. 4,336,862, Cl. 181-200.000.

Adamovske strojirny, narodni podnik: *See*—
Cerny, Arnost; Fiser, Jiri; Jiruse, Jaroslav; and Sedlak, Vaclav, 4,336,930, Cl. 271-277.000.
Liska, Zbynek, 4,336,755, Cl. 101-248.000.

Adams, Edward G., to Keystone Foods Corporation. Meat product and process of preparation. 4,337,275, Cl. 426-104.000.

Adler, Klaus; Hafener, Klaus; and Eck, Herbert, to Wacker-Chemie GmbH. Stabilized aqueous dispersions of vinyl chloride polymers. 4,337,323, Cl. 524-239.000.

Aetna Bearing Company: *See*—
Dagiel, Richard T., 4,336,972, Cl. 308-233.000.

Ahearn, James J.; and Culph, Kenneth C., to Ahearn, Main & Stott Pty. Ltd. Strip for forming a solar panel. 4,336,793, Cl. 126-450.000.

Ahearn, Main & Stott Pty. Ltd.: *See*—
Ahearn, James J.; and Culph, Kenneth C., 4,336,793, Cl. 126-450.000.

Aho, Yrjo . Basket for a skipole. 4,336,949, Cl. 280-824.000.

Ahramjian, Leo, to Du Pont de Nemours, E. I., and Company. Photocurable polyurethane film coatings. 4,337,130, Cl. 204-159.150.

Air Products and Chemicals, Inc.: *See*—
McNeil, Brian A., 4,337,072, Cl. 62-42.000.

Aisin Seiki Company, Limited: *See*—
Iwasaki, Shinichiro, 4,336,657, Cl. 33-174.00L.

Akagiri, Kenzo, to Sony Corporation. Compander circuit which produces variable pre-emphasis and de-emphasis. 4,337,445, Cl. 333-14.000.

Akao, Mutsuo; and Kashiwagi, Kenzo, to Fuji Photo Film Co., Ltd. Wrapping material for light-sensitive materials. 4,337,285, Cl. 428-35.000.

Akatsuka, Yasuo, to Nippon Electric Co., Ltd. Asynchronous circuit responsive to changes in logic level. 4,337,525, Cl. 365-233.000.

Akers, John B.; Littler, Jane A.; and Peters, David C., to Internationale Octrooi Maatschappij "Octropa" B.V. Process for the manufacture of soap. 4,337,209, Cl. 260-417.000.

Aktiebolaget Carl Munters: *See*—
Korsell, Lars E. R., 4,337,216, Cl. 261-112.000.

Aktiebolaget Hassle: *See*—
Junggren, Ulf K.; and Sjostrand, Sven E., 4,337,257, Cl. 424-263.000.

Akutsu, Eisaku; and Matsuura, Shigeo, to Hitachi, Ltd. Synchronizing signal discriminator for use in channel selection apparatus of television receiver. 4,337,486, Cl. 358-155.000.

Akutsu, Humio: *See*—
Yusa, Haruhiko; Iizuka, Yo; and Akutsu, Humio, 4,337,324, Cl. 525-72.000.

Akzo NV: *See*—
van den Bergh, Boudewijn, 4,337,299, Cl. 428-562.000.

Aleff, Hans P. Finger actuated pump assembly. 4,336,895, Cl. 222-207.000.

Alexander, Anton, to Fa. Gebr. Alexander Rheinische Musikinstrumentenfabrik GmbH. Musical instrument. 4,336,738, Cl. 84-390.000.

Alexander, David H.; Hershman, George H.; Jack, Michael D.; Koda, N. John; and Lloyd, Randahl B., to Hughes Aircraft Company. Monolithic imager. 4,337,395, Cl. 250-332.000.

Alexander, Kenneth L., to Omark Industries, Inc. Bullet seating die. 4,336,739, Cl. 86-43.000.

Alicot, Michel J. C.; and Tignol, Adrien P. N., to PCUK Produits Chimiques Ugine Kuhlmann. Process for the preparation of dibenzothiazyl disulfide. 4,337,344, Cl. 548-158.000.

Allada, Sambasiva R., to Dow Chemical Company, The. Multi-staged foaming of thermoplastic resin. 4,337,321, Cl. 521-143.000.

Allais, Andre; Clemence, Francois; Meier, Jean; and Deraedt, Roger, to Roussel UCLAF. Novel carboxylic acids, benzoyl phenyl alkanoic acids and use thereof. 4,337,353, Cl. 562-460.000.

Allegheny Ludlum Steel Corporation: *See*—
Malagari, Frank A., Jr., 4,337,101, Cl. 148-111.000.

Allen, Richard C.: *See*—
Shutske, Gregory M.; Setescak, Linda L.; and Allen, Richard C., 4,337,261, Cl. 424-272.000.

Allen, Robert J.; and Kauffman, Ivan L. Carton bottom tucking and tacking apparatus with pivotal tucker wings for packaging machines. 4,337,059, Cl. 493-184.000.

Allied Corporation: *See*—
Anello, Louis G.; Van Der Puy, Michael; Robinson, Martin A.; and Eibeck, Richard E., 4,337,361, Cl. 568-386.000.
Anello, Louis G., 4,337,362, Cl. 568-386.000.
Armor, John N., 4,337,358, Cl. 564-267.000.

Almasi, Istvan; Kassai, Ferenc; and Erdelyi, Attila, to Banyaszati Aknamelyito Vallalat. Apparatus for supplying oxygen to a user. 4,336,799, Cl. 128-201.240.

Alps Electric Co., Ltd.: *See*—
Inoue, Akihiko; and Sugiura, Shigekata, 4,337,382, Cl. 200-5.00E.

Alumax, Inc.: *See*—
Garrett, Luther W., Jr., 4,337,228, Cl. 423-114.000.

Amado, Juan J., Jr. Method of and apparatus for making spiral tubes. 4,336,702, Cl. 72-75.000.

Amano, Hidetoshi: *See*—
Noda, Kanji; Nakagawa, Akira; Motomura, Toshiharu; Tsuji, Masayoshi; Amano, Hidetoshi; and Ide, Hiroyuki, 4,337,270, Cl. 424-310.000.

Amano, Takehisa; Hamada, Seiya; Isii, Sigeki; and Takeda, Toshio, to Nippon Gakki Seizo Kabushiki Kaisha. Electronic musical instrument generating supplementary notes automatically established from played notes. 4,336,735, Cl. 84-1.170.

American Cyanamid Company: *See*—
Conrow, Ransom B.; and Bernstein, Seymour, 4,337,249, Cl. 424-180.000.

American Microcar Incorporated: *See*—
Pivar, Stuart, 4,336,964, Cl. 296-78.00R.

AMP Incorporated: *See*—
Feldman, Steven, 4,336,646, Cl. 29-564.200.

Ampex Corporation: *See*—
Holzgrafe, James R., 4,337,419, Cl. 315-371.000.

AMSTED Industries Incorporated: *See*—
Radwill, Robert P., 4,336,758, Cl. 105-4.00R.

AMTOY, Inc.: *See*—
Moreau, Claude R. M., 4,336,665, Cl. 46-153.000.

Anderson, Donald L.; Cherry, Isaac R.; Ripley, John A.; and Tanaka, David T., to Del Mar Avionics. Method and apparatus for arrhythmia analysis of ECG recordings. 4,336,810, Cl. 128-702.000.

Anderson, Martin C.; and Lonier, David T. Basic color media set for providing tonally matched palettes. 4,337,046, Cl. 434-103.000.

Ando, Hideo; Hayashi, Akira; Ohkouchi, Haruo; and Kitano, Kyozo, to Lion Corporation. Amine oxide-and alkali metal chloride-containing non-corrosive liquid detergent composition. 4,337,165, Cl. 252-105.000.

Ando, Ryuta; and Kinugawa, Kazumi, to Kabushiki Kaisha Aiwa. Front loading type record player. 4,337,533, Cl. 369-77.000.

Ando, Shizuo: *See*—
Kamimura, Teturo; Komatsubara, Masahiro; Ando, Shizuo; and Inanaga, Takugi, 4,337,490, Cl. 360-96.600.

Andrews, E. Trent; and Moore, Robert. Adjustable lower extremity splint with single point suspension. 4,336,796, Cl. 128-87.00R.

Andrews, Glenn C., to Pfizer Inc. Reduction of 2,5-diketogluconic acid. 4,337,350, Cl. 560-174.000.

Andrillon, Patrick: *See*—
Bugaut, Andree; and Andrillon, Patrick, 4,337,061, Cl. 8-405.000.

Anello, Louis G.; Van Der Puy, Michael; Robinson, Martin A.; and Eibeck, Richard E., to Allied Corporation. Liquid phase synthesis of hexafluoroacetone. 4,337,361, Cl. 568-386.000.

Anello, Louis G., to Allied Corporation. Conversion of hexafluorothiocetone dimer into hexafluoroacetone. 4,337,362, Cl. 568-386.000.

Angelini, Gianfranco: *See*—
Leoni, Roberto; Baldini, Alberto; Calloni, Angelo; and Angelini, Gianfranco, 4,337,095, Cl. 106-203.000.

Angwin, Meredith J.; and Pfefferle, William C., to United States of America, Environmental Protection Agency. Catalytic monolith, method of its formulation and combustion process using the catalytic monolith. 4,337,028, Cl. 431-7.000.

Anno, Nobuo: *See*—
Asaka, Urataro; Uesugi, Naomoto; and Anno, Nobuo, 4,336,864, Cl. 181-241.000.

Antonopios, Patricia A.; and Heilman, William J., to Gulf Oil Corporation. Laminates prepared from solutions of resins containing amic acid groups. 4,337,110, Cl. 156-307.400.

Antos, George J., to UOP Inc. Hydrocarbon dehydrocyclization with an attenuated superactive multimetallic catalytic composite. 4,337,146, Cl. 208-139.000.

Aoki, Hisashi: *See*—
Takamizawa, Minoru; Okada, Fumio; and Aoki, Hisashi, 4,337,348, Cl. 556-436.000.

Aoki, Minoru: *See*—
Yaguchi, Kunihide; Takaiwa, Masakazu; and Aoki, Minoru, 4,337,231, Cl. 423-243.000.

Appelbaum, Paul. Rebound exercise device for in-place jogging. 4,336,933, Cl. 272-70.000.

Appriou, Andre: *See*—
Comte, Georges N.; Appriou, Andre; and Couturier, Jean, 4,337,019, Cl. 425-116.000.

Arai, Fuminori: *See*—
Kitajima, Masao; Arai, Fuminori; and Kondo, Asaji, 4,337,222, Cl. 422-56.000.

Arao, Kozo: *See*—
Kanbe, Junichiro; Arao, Kozo; and Hosono, Nagao, 4,337,306, Cl. 430-122.000.

Arcamone, Federico: *See*—
Battistini, Carlo; Cassinelli, Giuseppe; Franceschi, Giovanni; Mazzoleni, Rosanna; and Arcamone, Federico, 4,337,248, Cl. 424-180.000.

Arimatsu, Seiji, to Nippon Paint Co., Ltd. Production of photosensitive resin cylinders. 4,337,220, Cl. 264-25.000.

Arita, Kishio; Murakawa, Kiyoshi; and Takahashi, Toshio, to Nippon Telegraph and Telephone Public Corporation; Nippon Bell Parts Co., Ltd.; and Nihon Telecommunication Engineering Corporation. Copper-nickel-tin alloys for lead conductor materials for integrated circuits and a method for producing the same. 4,337,089, Cl. 420-472.000.

Arizona Chemical Company: *See*—
Szita, Jeno G., 4,337,193, Cl. 260-97.500.

ARMAN S.p.A.: *See*—
Maiocco, Guiseppe, 4,336,625, Cl. 15-250.420.

Armor, John N., to Allied Corporation. Process for oxidizing primary amines to oximes by elemental oxygen. 4,337,358, Cl. 564-267.000.

Arnaldo Vigorelli S.p.A.: *See*—
Giolitti, Nicolo', 4,336,762, Cl. 112-158.00E.

Arnold, Arthur K.; and Sherman, Donald R., to Autotron Equipment Corporation. Transducer mount for wheel balancing machines. 4,336,715, Cl. 73-462.000.

Arnold, Arthur K.: *See*—
Mackay, Duncan R.; Arnold, Arthur K.; and Holm, Donald C., 4,337,055, Cl. 474-111.000.

Arold, George E.: *See*—
Jarvis, Grover F., Jr.; and Arold, George E., 4,336,629, Cl. 16-35.00R.

Arold, Hermann; Humburger, Siegbert; Diehr, Hans-Joachim; and Porkert, Helmut, to Bayer Aktiengesellschaft. Preparation of dimethyl polysulphides. 4,337,359, Cl. 568-21.000.

Artzer, Richard F., to Covington Brothers, Inc. Composite structural panel with offset core. 4,336,676, Cl. 52-309.700.

Asahi Kasei Kogyo Kabushiki Kaisha: *See*—
Watanabe, Itaru; Wataya, Isamu; and Tsushima, Sakae, 4,337,141, Cl. 204-301.000.

Asaka, Urataro; Uesugi, Naomoto; and Anno, Nobuo, to Honda Giken Kogyo Kabushiki Kaisha. Silencer for an internal combustion engine. 4,336,864, Cl. 181-241.000.

Asakura, Osamu; and Nozaki, Mineo, to Canon Kabushiki Kaisha. Printing apparatus of character wheel selection, stop and simultaneously printing type. 4,336,752, Cl. 101-99.000.

Asami, Masatoshi: *See*—
Mukaiyama, Teruaki; Sakito, Yoji; and Asami, Masatoshi, 4,337,346, Cl. 548-324.000.

ASARCO Incorporated: *See*—
Sweat, William T., 4,337,083, Cl. 75-5.000.

ASEA Aktiebolag: *See*—
Kindell, Bo, 4,337,404, Cl. 307-252.00L.

Assaf, Gad, to Solmat Systems, Ltd. Selective mixer for solar pond and method of using same. 4,336,999, Cl. 366-101.000.

Associated Engineering Limited: *See*—
Hunt, Norman, 4,336,857, Cl. 180-177.000.

Astoin, Jacques N., to Univablot. 1-Phenyl-4-morpholino-1-buten-3-01 derivatives, compositions and use. 4,337,252, Cl. 424-248.570.

Atari, Inc.: *See*—
Tuma, Wade B.; and Strohl, Niles E., 4,337,444, Cl. 332-31.00T.

Atlantic Richfield Company: *See*—
Ecker, Amir L.; and Pietsch, Joseph A., 4,336,692, Cl. 62-82.000.
Yoo, Jin S., 4,337,144, Cl. 208-120.000.

Atwood, Kenton; and Wright, James H., to United Catalysts Inc. Catalyst for steam reforming of hydrocarbons. 4,337,178, Cl. 252-466.00J.

AURO S.r.l: *See*—
Buttironi, Giovanni, 4,337,013, Cl. 414-240.000.

Augis, Jacques A.; and Lo, Christopher C. C., to Bell Telephone Laboratories, Incorporated. Hard gold surfaces. 4,337,133, Cl. 204-192.00C.

Automated Packaging Systems, Inc.: *See*—
Lerner, Bernard, 4,337,058, Cl. 493-11.000.

Automatic Liquid Packaging, Inc.: *See*—
Pagels, Louis T.; and Nagel, Dieter H., 4,337,025, Cl. 425-392.000.

Autotron Equipment Corporation: *See*—
Arnold, Arthur K.; and Sherman, Donald R., 4,336,715, Cl. 73-462.000.
Mackay, Duncan R.; Arnold, Arthur K.; and Holm, Donald C., 4,337,055, Cl. 474-111.000.

Autovox S.p.A.: *See*—
Cicatelli, Rodolfo, 4,337,489, Cl. 360-96.500.

Axen, Udo F.; and Sih, John C., to Upjohn Company, The. 2,5-Inter-o-phenylen-3,4-dinor-5,9α-epoxy $PGF_1$ amides. 4,337,203, Cl. 549-396.000.

Axen, Udo F.; and Sih, John C., to Upjohn Company, The. 2,5-Inter-o-phenylene-3,4-dinor-5,9α-epoxy-6-iodo-$PGF_1$ compounds. 4,337,337, Cl. 542-426.000.

Axen, Udo F.; and Sih, John C., to Upjohn Company, The. 2,5-Inter-o-phenylene-3,4-dinor-5,9α-epoxy-6-iodo-$PGF_1$ amides. 4,337,338, Cl. 542-426.000.

Axis Products Limited: *See*—
Martin, Stanley I.; and Martin, Edward J., 4,336,748, Cl. 98-33.00A.

Ayerst, McKenna & Harrison Inc.: *See*—
Treasurywala, Adi; Palameta, Bozidar; Bogri, Tibor; and Bagli, Jehan, 4,337,265, Cl. 424-274.000.

Ayme, Gerard, to Institut Merieux, S.A. Immunostimulant medicament and process of preparing same. 4,337,243, Cl. 424-92.000.

Azoulay, Moshe; and Smith, Albert B. Display and dispensing devices for garments. 4,336,886, Cl. 211-13.000.

Babb, Albert L.; and Scribner, Belding H., to Diachem, Inc. Aqueous acid concentrate for hemodialysis dialysate. 4,336,881, Cl. 206-525.000.

Babcock-Moxey Limited: *See*—
Cox, Eric R., 4,336,876, Cl. 198-509.000.

Babinsky, Andrew D.: *See*—
Gilligan, Thomas J., III; Strempel, Thomas G.; Dorio, Martin M.; and Babinsky, Andrew D., 4,337,126, Cl. 204-98.000.

Backlund, Stephen J.; and Olsen, Robert E., to United States of America, America. Method for producing 3,6-bis(carboethoxyamino)-2,5-diaziridinyl-1,4-benzoquinone. 4,337,196, Cl. 260-239.0EQ.

Bae, Young. Folding clothes hanger. 4,336,973, Cl. 312-199.000.

Baggiolini, Enrico G.; Lee, Hsi L.; and Uskokovic, Milan R., to Hoffmann-La Roche Inc. Preparation of biotin via thieno [3,2c] isoxazoles. 4,337,345, Cl. 548-242.000.

Bagli, Jehan: *See*—
Treasurywala, Adi; Palameta, Bozidar; Bogri, Tibor; and Bagli, Jehan, 4,337,265, Cl. 424-274.000.

Bahrmann, Helmut; Cornils, Boy; Frohning, Carl D.; and Weber, Jurgen, to Ruhrchemie Aktiengesellschaft. Process for the preparation of 3-(4-methyl-3-cyclohexen-1-yl) butyraldehyde. 4,337,363, Cl. 568-444.000.

Bailey, Thomas F., to Hughes Tool Company. Double cylinder system. 4,336,840, Cl. 166-77.000.

Baines, William R., to Ford Motor Company. Liquid propellant velocity assistance system for guns. 4,336,741, Cl. 89-7.000.

Baird, Dennis L. Apparatus for collecting and raising materials from the ocean floor. 4,336,662, Cl. 37-54.000.

Baisden, C. Robert. Nutrient compound. 4,337,245, Cl. 424-131.000.

Bajon, Jean: *See*—
Favreau, Michel; Bajon, Jean; Cattoen, Michel; Soca, Serge; Longuet, Maurice; and Delattre, Christian, 4,337,514, Cl. 364-515.000.

Baker, Alan C.: *See*—
Keran, Vitie P.; and Baker, Alan C., 4,337,084, Cl. 75-36.000.

Baker, Gene G.: *See*—
Knudson, Curtis L.; Willson, Warrack G.; Baker, Gene G.; Sondreal, Everett A.; and Farnum, Sylvia A., 4,337,142, Cl. 208-8.0LE.

Baker Instruments Corp.: *See*—
Farina, Peter R.; and Grattan, James A., 4,337,339, Cl. 544-257.000.

Baker, John E.: *See*—
Vitols, Reinhards; Woodward, Adrian M.; Baker, John E.; and Wray, Gordon R., 4,336,697, Cl. 66-148.000.

Baker, Kenneth D.: *See*—
El-Shazly, Mohamed F.; and Baker, Kenneth D., 4,337,091, Cl. 106-1.230.

Baker, Steven W., to Champion Corporation. Position detector for a power rodding apparatus. 4,337,392, Cl. 235-92.0DN.

Baldini, Alberto: *See*—
Leoni, Roberto; Baldini, Alberto; Calloni, Angelo; and Angelini, Gianfranco, 4,337,095, Cl. 106-203.000.

Ball Corporation: *See*—
McDowell, Jerry T., 4,336,704, Cl. 72-324.000.

Balser, Klaus; and Beger, Walter, to Wolff Walsrode AG. Fibre-reinforced metallic luster pigmented tubular casing and a process for its production. 4,336,828, Cl. 138-118.100.

Baltimore Therapeutic Equipment Company: *See*—
Engalitcheff, John, Jr., 4,337,050, Cl. 434-260.000.

Baltscheffsky, Arne; and Karkkainen, Alpo, to Oy Wartsila Ab. Cylinder lock. 4,336,700, Cl. 70-366.000.

Bando Chemical Industries, Ltd.: *See*—
Wada, Hiroshi, 4,336,767, Cl. 118-264.000.

Banton, Martin E., to Xerox Corporation. Light collector rod for use in xerographic systems. 4,336,993, Cl. 355-3.00R.

Banton, Martin E., to Xerox Corporation. Multi-mode color copier. 4,336,994, Cl. 355-4.000.

Banyaszati Aknamelyito Vallalat: *See*—
Almasi, Istvan; Kassai, Ferenc; and Erdelyi, Attila, 4,336,799, Cl. 128-201.240.

Barber-Greene Company: *See*—
Farnham, Robert E., 4,337,014, Cl. 414-332.000.

Barchi, Rolfo, to Karl August Heimsoth Industrie. Firing kiln; with emphasis on rollers for a firing kiln. 4,337,035, Cl. 432-246.000.

Barcita, Jose M. Power transmission. 4,336,723, Cl. 74-44.000.

Barmag Barmer Maschinenfabrik AG: *See*—
Greb, Manfred, 4,336,912, Cl. 242-46.400.

Barnhart, David A.; Kroger, John E.; and Walters, David A., to Celotex Corporation, The. Fan housing unit and mounting device therefor. 4,336,749, Cl. 98-43.00R.

Bartsch, Gunther M. Combustion apparatus and method of assembly. 4,336,790, Cl. 126-58.000.

Bascus, Lionel D. Water conditioning systems. 4,336,627, Cl. 15-321.000.

BASF Wyandotte Corporation: *See*—
Eisenstein, Stephen E., 4,336,685, Cl. 57-238.000.

Basilico, Albert R.; and Wilfinger, Raymond J., to Discovision Associates. Solid state electro-optical track follower array. 4,337,534, Cl. 369-111.000.

Bates, Charles A., III: *See*—
Cohn, Martin; Jacoby, George V.; and Bates, Charles A., III, 4,337,458, Cl. 340-347.0DD.

Battistini, Carlo; Cassinelli, Giuseppe; Franceschi, Giovanni; Mazzoleni, Rosanna; and Arcamone, Federico, to Farmitalia Carlo Erba S.p.A. Paromomycin containing compounds and method of use. 4,337,248, Cl. 424-180.000.

Batz, Hans-Georg; Rauscher, Elli; Weimann, Gunter; Wahlefeld, August W.; and Gruber, Wolfgang, to Boehringer Mannheim GmbH. Method for the determination of α-amylase. 4,337,310, Cl. 435-22.000.

Baumgard, Stuart H.: *See*—
Schwartz, Donald R.; and Baumgard, Stuart H., 4,336,621, Cl. 5-446.000.

Baumgartner, Viktor: *See*—
Ross, Dieter; and Baumgartner, Viktor, 4,336,997, Cl. 356-4.000.

Baxter Travenol Laboratories, Inc.: *See*—
Stone, Albert J.; and Nissen, Michael D., 4,336,802, Cl. 128-272.000.

Bayer Aktiengesellschaft: *See*—
Arold, Hermann; Humburger, Siegbert; Diehr, Hans-Joachim; and Porkert, Helmut, 4,337,359, Cl. 568-21.000.
Muschelknautz, Edgar; and Rink, Norbert, 4,337,074, Cl. 65-5.000.
Naumann, Klaus, 4,337,352, Cl. 562-401.000.
Reiff, Helmut; and Dieterich, Dieter, 4,337,333, Cl. 528-67.000.
Stetter, Jorg; and Brandes, Wilhelm, 4,337,268, Cl. 424-285.000.
Vater, Hans-Joachim; Nickel, Horst; and Henk, Hermann, 4,337,195, Cl. 260-146.00T.

Bayerische Motoren Werke Aktiengesellschaft: *See*—
Flohr, Peter; and Gumpinger, Franz, 4,337,432, Cl. 324-379.000.

Beard, Ian A., to United States Borax & Chemical Corp. Compositions and methods for producing clayware. 4,337,317, Cl. 501-142.000.

Beck, Donald: *See*—
Mick, Peter; and Beck, Donald, 4,337,481, Cl. 358-105.000.

Beck, Theodore R.; and Ruggeri, Robert T., to Electrochemical Technology Corp. Prosthesis electrode with multi-layer membrane. 4,336,811, Cl. 128-784.000.

Becton, Dickinson and Company: *See*—
Lynn, Robert W., 4,337,104, Cl. 156-69.000.
Mehl, Jack J., 4,336,880, Cl. 206-524.400.

Beecham Group Limited: *See*—
Smith, Richard A. G., 4,337,244, Cl. 424-94.000.

Beger, Walter: *See*—
Balser, Klaus; and Beger, Walter, 4,336,828, Cl. 138-118.100.

Belcher, Richard A.: *See*—
Kozacka, Frederick J.; and Belcher, Richard A., 4,337,452, Cl. 337-231.000.

Bell & Howell Company: *See*—
Pontoni, George E., 4,336,900, Cl. 226-97.000.

Bell, Lon E., to Technar, Inc. Glow plug control device for diesel engines. 4,337,389, Cl. 219-511.000.

Bell Telephone Laboratories, Incorporated: *See*—
Augis, Jacques A.; and Lo, Christopher C. C., 4,337,133, Cl. 204-192.00C.
Blank, Stuart L.; Gyorgy, Ernst M.; LeCraw, Roy C.; and Luther, Lars C., 4,337,521, Cl. 365-33.000.
Fraser, David B.; and Murarka, Shyam P., 4,337,476, Cl. 357-67.000.
Jin, Sungho, 4,337,100, Cl. 148-31.550.
Judd, Frank F.; and Westerman, George R., 4,337,520, Cl. 365-6.000.
O'Bryan, Henry M., Jr.; and Thomson, John, Jr., 4,337,446, Cl. 333-238.000.
Seiler, Edwin N., 4,336,792, Cl. 126-420.000.
Spahn, Gary L., 4,337,466, Cl. 340-870.090.

Bellanti, Joseph A.: *See*—
Oeschger, Max P.; Hooke, Anne M.; and Bellanti, Joseph A., 4,337,314, Cl. 435-253.000.

Bellus, Daniel: *See*—
Zweifel, Hans; Schilling, Walter; Storni, Angelo; and Bellus, Daniel, 4,337,200, Cl. 548-451.000.

Ben Venue Laboratories, Inc.: *See*—
Kaye, Saul, 4,337,223, Cl. 422-112.000.

Benckhuijsen, Gerrit J., to Temova Etablissement. Waistcoat for therapeutic treatment. 4,336,807, Cl. 128-379.000.

Benckiser-Knapsack GmbH: *See*—
Rohlfs, Hans-Adolf; Kling, Alfred; Raab, Guenter; Vogt, Michael; Specht, Viktor; and Schaetzke, Ulrike, 4,337,214, Cl. 260-502.500.

Bendix Corporation, The: *See*—
Woo, Ji Y., 4,336,867, Cl. 188-326.000.

Beran, Anthony V., to Beran, Anthony V. Medical corrugated respiratory tube. 4,336,798, Cl. 128-200.140.

Beretta, Paolo; Leichter, Louis M.; and Stofko, John J., Jr., to Minnesota Mining and Manufacturing Company. Sensitized organic electron donor compounds. 4,337,305, Cl. 430-82.000.

Bergendahl, Hans-Georg: *See*—
Koppern, Heinz; Bergendahl, Hans-Georg; Rieschel, Hartmut; and Koch, Friedhelm, 4,337,023, Cl. 425-237.000.

Berger, Jean L.; and Coutures, Jean L., to Thomson-CSF. Charge-transfer phase-inverter device and differential amplifier comprising said device. 4,337,403, Cl. 307-221.00D.

Bergkvist, Lars A. Angle indicator for indicating two mutually perpendicular directions. 4,336,659, Cl. 33-395.000.

Berglund, Carl O., to Teledyne Exploration Company. Method of making a seismic apparatus. 4,336,639, Cl. 29-25.350.

Berke, Philip A.; and Rosen, William E., to Sutton Laboratories, Inc. Preservative compositions. 4,337,269, Cl. 424-289.000.

Bernard, Walter J.: *See*—
Russell, Philip G.; Bernard, Walter J.; and Ross, Sidney D., 4,337,114, Cl. 156-656.000.

Bernareggi, Virgilio; Crespi, Giuseppe; and Bugada, Giuseppe, to Valeas S. R. L. Industria Chimica E Farmaceutica. Amino-ethanol derivatives. 4,337,272, Cl. 424-316.000.

Bernstein, Seymour: *See*—
Conrow, Ransom B.; and Bernstein, Seymour, 4,337,249, Cl. 424-180.000.

Best, Lorne A., to National Element, Inc. Electric heating element. 4,337,390, Cl. 219-532.000.

Beumling, Herbert: *See*—
Hestermann, Klaus; Maurer, Alexander; Kandler, Joachim; Mietens, Gerhard; and Beumling, Herbert, 4,337,092, Cl. 106-14.050.

Bhatia, Ravi R., to Timken Company, The. Bearing setting process. 4,336,641, Cl. 29-148.40A.

Billet, Rene, to Societe Anonyme Francaise du Ferodo. Clutch mechanism. 4,336,871, Cl. 192-107.00C.

Binder, Georg, to Robert Bosch GmbH. Bearing-less remotely journalled dynamo electric machine, particularly alternator for combination with a gas turbine. 4,337,406, Cl. 310-91.000.

Binks Manufacturing Co.: *See*—
Springer, Carl M., 4,337,282, Cl. 427-421.000.

Binsley, Robert L.: *See*—
Wagner, William R.; Wright, David E.; and Binsley, Robert L., 4,336,839, Cl. 166-59.000.

Biotteau, Gerard, to Societe a Responsabilite Limitee Eram Industrie. Sheet material for use as playing surfaces and method for the manufacture thereof. 4,337,292, Cl. 428-141.000.

Bird, John M.; and Ringwood, Alfred E. Container for radioactive nuclear waste materials. 4,337,167, Cl. 252-633.000.

Blair, W. Roscoe, to Raybestos-Manhattan, Inc. Mechanical-dynamic rotary seal. 4,336,944, Cl. 277-81.00R.

Blake, Peter J.: *See*—
Turner, Edward W.; and Blake, Peter J., 4,337,024, Cl. 425-363.000.

Blanchard, Floyd W. Stand for supporting a hand-held implement. 4,336,916, Cl. 248-471.000.

Blank, Stuart L.; Gyorgy, Ernst M.; LeCraw, Roy C.; and Luther, Lars C., to Bell Telephone Laboratories, Incorporated. Advantageous garnet based devices. 4,337,521, Cl. 365-33.000.

Blanton, Kistler J., Jr. Wire rope lubricator cleaner. 4,336,866, Cl. 184-15.00R.

Bloom Engineering Company, Inc.: *See*—
Morgan, John W., II; and Leumann, Hans E., 4,337,034, Cl. 432-234.000.

Bock, Erich; Wulfhorst, Burkhard; Hini, Eugen; and Grupp, Bernhard, to Schubert & Salzer. Mechanism for the production of a wrapped yarn. 4,336,683, Cl. 57-18.000.

Bodendorf, Warren J.; and Presto, Alphonse R., to Texon Inc. Decay resistant material. 4,337,117, Cl. 162-161.000.

Bodine, Albert G. Cyclic wave system for unclogging water screens. 4,337,158, Cl. 210-785.000.

Bodine Electric Company: *See*—
Oltendorf, Norman E., 4,337,428, Cl. 318-696.000.

Boehringer Mannheim GmbH: *See*—
Batz, Hans-Georg; Rauscher, Elli; Weimann, Gunter; Wahlefeld, August W.; and Gruber, Wolfgang, 4,337,310, Cl. 435-22.000.

Boersma, Michael A. M.; Nanne, Johannes M.; and Post, Martin F. M., to Shell Oil Company. Process for the preparation of crystalline silicates. 4,337,176, Cl. 252-459.000.

Boetto, Charles, to International Harvester Co. Agricultural folding tool bar. 4,336,846, Cl. 172-776.000.

Bogri, Tibor: *See*—
Treasurywala, Adi; Palameta, Bozidar; Bogri, Tibor; and Bagli, Jehan, 4,337,265, Cl. 424-274.000.

Boise Cascade Corporation: *See*—
Hearon, William M.; and Witte, John F., 4,337,202, Cl. 549-314.000.

Boisvert, Donald R.: *See*—
Duff, James A.; and Boisvert, Donald R., 4,336,631, Cl. 16-126.000.

Boone, Jacob J., to Nordson Corporation. Method for striping inside seams of cans. 4,337,281, Cl. 427-236.000.

Bourassin, Lucien; Condat, Bernard; Fortin, Jacques; Leger, Alain; Soto, Joseph; and Solvinto, Jean-Claude, to Syndicat des Constructeurs d'Appareils Radio Recepteurs et Televiseurs (SCART). Dynamic audio-video interconnection system. 4,337,480, Cl. 358-93.000.

Bourlet, Maurice V., to Fabrique Nationale Herstal. Loader for machine-pistol and similar. 4,336,742, Cl. 89-34.000.

Bowles Fluidics Corporation: *See*—
Stouffer, Ronald D., 4,336,909, Cl. 239-381.000.

Bradley, Timothy G., to Manville Service Corporation. Biopolymer filtration process. 4,337,157, Cl. 210-691.000

Bradshaw, David A.; and Oles, Joseph F., to Hoover Company, The. Nozzle with pivoted wand. 4,336,628, Cl. 15-415.00R.

Braeger, Horst, to Nordischer Maschinenbau Rud. GmbH Co. KG. Apparatus for the severing of the fillets from the skeleton of fish. 4,336,634, Cl. 17-57.000.

Brambring, Jorg: *See*—
van der Heijden, Antonius W. F.; Brambring, Jorg; and Spruyt, Johannes M. J., 4,337,409, Cl. 313-409.000.

Brandes, Wilhelm: *See*—
Stetter, Jorg; and Brandes, Wilhelm, 4,337,268, Cl. 424-285.000.

Brandt, John L.: *See*—
Graham, John W.; Sinclair, A. Richard; and Brandt, John L., 4,336,842, Cl. 166-276.000.

Braun Aktiengesellschaft: *See*—
Horz, Eberhard; Wirsing, Robert; and Hoffmann, Gunter, 4,336,816, Cl. 134-110.000.

Braun, Roland, to Raschig GmbH. Contacting arrangement for mass transfer operations and set of plates for use in said arrangement. 4,337,217, Cl. 261-112.000.

Breglia, Denis R.: *See*—
Rodemann, Alfred H.; and Breglia, Denis R., 4,336,976, Cl. 350-3.750.

Brenner, Kurt H., Jr.; LaTulip, Arthur C.; and Oetken, James E., to North American Philips Consumer Electronics Corp. Process for disposing an opaque conductive band on the sidewall of a CRT panel. 4,337,304, Cl. 430-24.000.

Breunig, Anton, to Haindl Papier GmbH. Fiber fractionating device. 4,337,150, Cl. 209-237.000.

Briche, Raymond L.: *See*—
Rollot, Pierre H.; Cordier, Jean A.; and Briche, Raymond L., 4,336,925, Cl. 266-193.000.

British Broadcasting Corporation: *See*—
Chambers, John P., 4,337,485, Cl. 358-147.000.

British Hovercraft Corporation Ltd.: *See*—
Wheeler, Raymond L., 4,337,106, Cl. 156-228.000.

Broadcom, Incorporated: *See*—
Gruenberg, Elliot L., 4,337,376, Cl. 179-2.0EB.

Brock, Josef, to Maschinenfabrik Carl Zangs Aktiengesellschaft. Dobby mechanism. 4,336,829, Cl. 139-76.000.

Brog, Roy A. Imitation milk. 4,337,278, Cl. 426-583.000.

Bromley, Charles; and Thompson, Morice W., to Imperial Chemical Industries Limited. Polymerization process. 4,337,189, Cl. 523-332.000.

Bronsther, Burton: *See*—
Latucca, Vincent; and Bronsther, Burton, 4,336,797, Cl. 128-132.00D.

Brookhart, Marshall R.; Hodge, Fredrick J.; and Worden, Thomas J., to Minnesota Mining and Manufacturing Company. Head positioning transducer for helical scan video reproducer. 4,337,492, Cl. 360-109.000.

Brosch, Eric J.: *See*—
Mechel, John R.; and Brosch, Eric J., 4,337,075, Cl. 65-12.000.

Broussaud, Georges; and Tinet, Claude, to Thomson-CSF. Apparatus for the transcription of a video disk onto a cenefilm. 4,337,484, Cl. 358-128.600.

Brown, John D.: *See*—
MacLean, John P.; Cantwell, J. Edward; Brown, John D.; and Hoy, Harold D., 4,337,068, Cl. 55-1.000.

Bruns, James A., to Uniroyal, Inc. Mechanical power transmission system. 4,337,056, Cl. 474-153.000.

Brutosky, Andrew J. Gate Assembly. 4,336,670, Cl. 49-409.000.

Bryant, Patrick S.: *See*—
Cooper, Gordon; and Bryant, Patrick S., 4,337,284, Cl. 428-35.000.

Bucci, Carlo G., to Repla Limited. Frame corner structure. 4,336,645, Cl. 29-510.000.

Buchberger, Gerhard: *See*—
Holst, Arno; Perplies, Eberhard; and Buchberger, Gerhard, 4,337,328, Cl. 525-336.000.

Buder, Wolfgang; Wolff, Siegfried; and Kleinschmit, Peter, to Degussa Aktiengesellschaft. Nitrogen containing alkoxysilane and process for its production. 4,337,205, Cl. 260-349.000.

Bugada, Giuseppe: *See*—
Bernareggi, Virgilio; Crespi, Giuseppe; and Bugada, Giuseppe, 4,337,272, Cl. 424-316.000.

Bugaut, Andree; and Andrillon, Patrick, to Societe Anonyme dite: L'OREAL. Hair dye compositions and new compounds useful therein. 4,337,061, Cl. 8-405.000.

Bunker Ramo Corporation: *See*—
Monaghan, Kevin J.; and Schwickert, Russell C., 4,336,977, Cl. 350-96.200.
Quinton, Carrol D.; and Guio, Raphael, 4,337,135, Cl. 204-213.000.

Burkinshaw, Norman F., to Vandervell Products Limited. Bearings. 4,336,970, Cl. 308-79.00R.

Burleigh Instruments, Inc.: *See*—
Clark, William G., 4,336,809, Cl. 128-665.000.

Burroughs Corporation: *See*—
Spracklen, John E.; and Gerhold, Mark L. C., 4,337,465, Cl. 340-825.030.

Burroughs Wellcome Co.: *See*—
Gorvin, John H., 4,337,274, Cl. 424-321.000.
Moncada, Salvador E., 4,337,254, Cl. 424-251.000.
Whittaker, Norman; and Caldwell, Albert G., 4,337,262, Cl. 424-273.00R.

Burstein, Neal L.; and Maurice, David M., to Leland Stanford Junior University, The Board of Trustees of the. Cryojet rapid freezing apparatus. 4,336,691, Cl. 62-64.000.

Butler, David V.: *See*—
Orlowski, Jan A.; Butler, David V.; and Kidd, Patrick D., 4,337,349, Cl. 560-30.000.

Buttironi, Giovanni, to AU.RO S.r.l. Plant with mobile platforms for parking motor vehicles or the like. 4,337,013, Cl. 414-240.000.

B.V. Machinefabriek Breda v/h Backer & Rueb: *See*—
Engelberts, Gerhardus A., 4,336,642, Cl. 29-157.30A.

Byk Gulden Lomberg Chemische Fabrik GmbH: *See*—
Eistetter, Klaus; and Rapp, Erich, 4,337,267, Cl. 424-278.000.

Byrd, James D.; and Field, Lamar, to United States of America, Army. Method of case bonding propellant. 4,337,218, Cl. 264-3.00R.

C. Desaga GmbH Nachf. Erich Fecht: *See*—
Vesterberg, Olof, 4,337,131, Cl. 204-180.00G.

C. Keller GmbH & Co., KG, Maschinenfabrik: *See*—
Kamphues, Hermann, 4,336,874, Cl. 198-458.000.

C. M. Industries: *See*—
Diaz, Joseph; and Guegan, Remy, 4,337,194, Cl. 260-112.50S.

Caere Corporation: *See*—
Smith, William R., 4,337,455, Cl. 340-146.3AG.

Cagnoni, Giacomo. Pre-compressed air weapon. 4,336,787, Cl. 124-69.000.

Cahen, George L., Jr.: *See*—
Stoner, Glenn E.; and Cahen, George L., Jr., 4,337,138, Cl. 204-290.00R.

Caldwell, Albert G.: *See*—
Whittaker, Norman; and Caldwell, Albert G., 4,337,262, Cl. 424-273.00R.

Calloni, Angelo: *See*—
Leoni, Roberto; Baldini, Alberto; Calloni, Angelo; and Angelini, Gianfranco, 4,337,095, Cl. 106-203.000.

Calundann, Gordon W., to Celanese Corporation. Polyester of 6-hydroxy-2-naphthoic acid and meta-hydroxy benzoic acid capable of readily undergoing melt processing. 4,337,190, Cl. 524-599.000.

Camco, Incorporated: *See*—
Garner, James K., Jr., 4,336,841, Cl. 166-216.000.

Cammack, Michael A.; Elkins, Christopher W.; Hickman, Clarence J.; and Mullins, Keith M., to Teledyne Industries, Inc. Oral hygiene appliances. 4,337,040, Cl. 433-80.000.

Campbell, Richard W., to General Electric Company. Thermoplastic molding composition having improved warp resistance and process for preparing the same. 4,337,192, Cl. 523-212.000.

Candel Industries, Limited: *See*—
Schweitzer, Ernest D., 4,336,722, Cl. 73-863.120.

Canon Kabushiki Kaisha: *See*—
Asakura, Osamu; and Nozaki, Mineo, 4,336,752, Cl. 101-99.000.
Hamatani, Masahide, 4,336,979, Cl. 350-255.000.
Isobe, Takashi, 4,336,991, Cl. 354-286.000.
Kanbe, Junichiro; Arao, Kozo; and Hosono, Nagao, 4,337,306, Cl. 430-122.000.
Matsumura, Susumu; and Suzuki, Takashi, 4,336,989, Cl. 354-200.000.
Suzuki, Takashi, 4,336,978, Cl. 350-167.000.
Tanaka, Kazuo; and Tsuji, Sadahiko, 4,336,983, Cl. 350-427.000.
Yano, Yasuhiro, 4,337,467, Cl. 346-1.100.

Cantwell, J. Edward: *See*—
MacLean, John P.; Cantwell, J. Edward; Brown, John D.; and Hoy, Harold D., 4,337,068, Cl. 55-1.000.

Cap, Heinrich; von der Heide, Johann; and Muller, Rolf, to Papst-Motoren KG. Speed control for a rotary machine. 4,337,424, Cl. 318-328.000.

Cappotto, Samuel D., to SCM Corporation. Releasable ribbon locking device in a ribbon cartridge. 4,337,001, Cl. 400-208.000.

Carkoski, Eugene T. Cartridge case lubricator. 4,336,865, Cl. 184-14.000.

Carl, William P.: *See*—
Ezzell, Bobby R.; Carl, William P.; and Mod, William A., 4,337,211, Cl. 260-456.00F.

Carl Zeiss-Stiftung: *See*—
Flother, Werner, 4,336,990, Cl. 354-272.000.

Carlisle Tire & Rubber Co.: *See*—
Hollis, Jack L., 4,337,112, Cl. 156-351.000.

Carlotta, Michael: *See*—
Maher, James C.; and Carlotta, Michael, 4,336,766, Cl. 118-60.000.

Carney, Richard W. J.; and De Stevens, George, to Ciba-Geigy Corporation. Tertiary aminoacids in the treatment of pain. 4,337,264, Cl. 424-274.000.

Carney, William V.; and Singer, Loren A., Jr., to Porta Systems Corp. Carbon electrode having metallic heat sink. 4,337,495, Cl. 361-119.000.

Caro, Israel. Circular safety razor. 4,336,651, Cl. 30-49.000.

Carouthers, Middleton M.; and Klamm, Robert L., to Carouthers, Middleton M. Energy conservation apparatus for internal combustion engines. 4,336,773, Cl. 123-25.00B.

Carpenter, Clarence W., Jr.: *See*—
Reed, Ronald L.; and Carpenter, Clarence W., Jr., 4,337,159, Cl. 252-8.55D.

Carr Cedar Products, Inc.: *See*—
Carr, Charles E., 4,336,879, Cl. 206-323.000.

Carr, Charles E., to Carr Cedar Products, Inc. Shim bundle. 4,336,879, Cl. 206-323.000.

Carrell, Jessie W. Water limer. 4,336,822, Cl. 137-268.000.

Carrier, John A., to Plessey Handel und Investments A.G. Volume control mechanism for a bell assembly. 4,337,461, Cl. 340-402.000.

Carty, Larry G.: *See*—
Sakowski, Walter J.; Shaffer, John H.; and Carty, Larry G., 4,337,236, Cl. 423-474.000.

Caso, Adolph. Plant waterers. 4,336,666, Cl. 47-48.500.

Cassinelli, Giuseppe: *See—*
Battistini, Carlo; Cassinelli, Giuseppe; Franceschi, Giovanni; Mazzoleni, Rosanna; and Arcamone, Federico, 4,337,248, Cl. 424-180.000.

Castagnoli, Neal: *See—*
Goodman, Murray; Verlander, Michael S.; Jacobson, Kenneth A.; Melmon, Kenneth L.; and Castagnoli, Neal, 4,337,207, Cl. 260-404.500.

Casteel, Ronald C. Automotive electrical harness. 4,336,975, Cl. 339-28.000.

Caterpillar Tractor Co.: *See—*
Golan, Kenneth F., 4,336,827, Cl. 137-624.270.
Kilty, Alan L., 4,337,386, Cl. 219-130.210.

Cattelani, Claude; and Perichon, Catherine. Variable-focal-length objective and an optical system equipped with objectives of this type for the production of special effects on film. 4,336,996, Cl. 355-39.000.

Cattoen, Michel: *See—*
Favreau, Michel; Bajon, Jean; Cattoen, Michel; Soca, Serge; Longuet, Maurice; and Delattre, Christian, 4,337,514, Cl. 364-515.000.

Celanese Corporation: *See—*
Calundann, Gordon W., 4,337,190, Cl. 524-599.000.
Kollar, John, 4,337,371, Cl. 568-852.000.

Celotex Corporation, The: *See—*
Barnhart, David A.; Kroger, John E.; and Walters, David A., 4,336,749, Cl. 98-43.00R.

Ceolotto, Egidio, to Monseol Limited. Compression refrigeration unit adjustable in accordance with the liquid flowing out from the evaporator. 4,336,695, Cl. 62-504.000.

Cerny, Arnost; Fiser, Jiri; Jiruse, Jaroslav; and Sedlak, Vaclav, to Adamovske strojirny, narodni podnik. Sheet transfer attachment. 4,336,930, Cl. 271-277.000.

Chambers, John P., to British Broadcasting Corporation. Broadcast teletext system. 4,337,485, Cl. 358-147.000.

Champion Corporation: *See—*
Baker, Steven W., 4,337,392, Cl. 235-92.0DN.

Chandler, Robert M.: *See—*
Hinkel, Lester H.; and Chandler, Robert M., 4,336,619, Cl. 4-619.000.

Chaplin, Gary F., to United Technologies Corporation. Wedge-shaped seal for flanged joints. 4,336,943, Cl. 277-26.000.

Chaplin, Gary F., to United Technologies Corporation. Dual wall seal means. 4,337,016, Cl. 415-116.000.

Chavand, Jean; Daguenet, Maurice; and Gillet, Rene, to Commissariat a l'Energie Atomique. Process for cutting out a wall made of metal or metal alloy. 4,337,098, Cl. 148-9.00R.

Chemische Fabriek Zaltbommel: *See—*
van der Maas, Hendrikus J. H., 4,337,210, Cl. 260-439.00R.

Chemische Werke Huls AG: *See—*
Hentschel, Bernhard; Ziebarth, Jurgen; Coenen, Alfred; Kosswig, Kurt; and von Praun, Ferdinand, 4,337,234, Cl. 423-424.000.
Rigler, Josef K.; Ratajczak, Hans-Josef; Leithauser, Horst; and Trukenbrod, Karl, 4,337,319, Cl. 521-96.000.

Chen, Li-Fu. Automatic digit display machine for measuring height and weight. 4,336,855, Cl. 177-245.000.

Chen, Tsung-I: *See—*
Sahyun, Melville R. V.; Chen, Tsung-I; King, Timothy W.; Mikelsons, Valdis; and Mitra, Smarajit, 4,337,303, Cl. 430-11.000.

Cherry, Isaac R.: *See—*
Anderson, Donald L.; Cherry, Isaac R.; Ripley, John A.; and Tanaka, David T., 4,336,810, Cl. 128-702.000.

Chevron Research Company: *See—*
Spars, Byron G.; Tamm, Paul W.; and Wallman, P. Henrik, 4,337,120, Cl. 196-125.000.
Stayner, Robert A., 4,337,161, Cl. 252-49.500.

Chiang, John S.; and Goldstein, David, to FMC Corporation. Preparation of strontium nitrate from celestite and calcium nitrate. 4,337,233, Cl. 423-397.000.

Chikama, Toshio, to Machida Endoscope Co., Ltd. Guide tube. 4,336,794, Cl. 128-4.000.

Choe, Seong-Hyeon: *See—*
Kim, Choong-Ki; Kwak, Tae-Kyun; and Choe, Seong-Hyeon, 4,337,475, Cl. 357-36.000.

Christensen, Inc.: *See—*
Fielder, Coy M., 4,336,850, Cl. 175-393.000.

Christenson, Roger M.: *See—*
Schimmel, Karl F.; Seiner, Jerome A.; Dowbenko, Rostyslaw; and Christenson, Roger M., 4,337,184, Cl. 524-726.000.

Christiansen, Keith W.; and Vering, Anthony W., to CR Industries. Sinuous seal with auxiliary excluder lips. 4,336,945, Cl. 277-153.000.

Ciba-Geigy Corporation: *See—*
Carney, Richard W. J.; and De Stevens, George, 4,337,264, Cl. 424-274.000.
Zweifel, Hans; Schilling, Walter; Storni, Angelo; and Bellus, Daniel, 4,337,200, Cl. 548-451.000.

Cicatelli, Rodolfo, to Autovox S.p.A. Device for the programmed control of operative sequences, in particular for cassette-type tape recorders. 4,337,489, Cl. 360-96.500.

Cichy, Paul, to Kennecott Corporation. Recovery of precious metals from spent alumina-containing catalysts. 4,337,085, Cl. 75-83.00R.

Citizen Watch Company Limited: *See—*
Morokawa, Shigeru, 4,337,529, Cl. 368-10.000.

Clarion Co., Ltd.: *See—*
Takai, Kazuki, 4,337,487, Cl. 360-71.000.
Tezuka, Hisao; and Furui, Hiroshi, 4,337,380, Cl. 179-146.00E.

Clark, William G., to Burleigh Instruments, Inc. Human and animal tissue photoradiation system and method. 4,336,809, Cl. 128-665.000.

Clelford, Douglas H.: *See—*
Murphy, Richard D.; and Clelford, Douglas H., 4,337,516, Cl. 364-551.000.

Clemence, Francois: *See—*
Allais, Andre; Clemence, Francois; Meier, Jean; and Deraedt, Roger, 4,337,353, Cl. 562-460.000.

Clements, Anthony H., to Lever Brothers Company. Bleach composition. 4,337,164, Cl. 252-96.000.

Clifford, Jack R., to Pratt, Paul L.; and Pierce, John T., Jr., part interest to each. Method and implement for cleaning drains. 4,337,096, Cl. 134-8.000.

Climenhage, David C.; and Eadie, Walter R., to Du Pont Canada Inc. Polyolefin composition for manufacture of film having cling properties. 4,337,188, Cl. 524-140.000.

Clinard, Glenn G.; Mulhollam, Gail R.; and Volk, Frank J., to United States of America, Air Force. Moving vehicle seismic target detector. 4,337,528, Cl. 367-136.000.

Clorox Company, The: *See—*
Marynowski, Chester W.; and Geigel, Maria A., 4,337,213, Cl. 260-502.00R.

Cochran, Andrew A.: *See—*
Soboroff, David M.; Troyer, Jerry D.; and Cochran, Andrew A., 4,337,129, Cl. 204-151.000.

Cochran, Cary L.: *See—*
Mannon, Walter L.; and Cochran, Cary L., 4,336,786, Cl. 124-23.00R.

Cody, Robert D. F.; and Hull, Amy B., to Iowa State University Research Foundation, Inc. Method of growth of primary anhydrite crystals under moderate conditions. 4,337,238, Cl. 423-555.000.

Coenen, Alfred: *See—*
Hentschel, Bernhard; Ziebarth, Jurgen; Coenen, Alfred; Kosswig, Kurt; and von Praun, Ferdinand, 4,337,234, Cl. 423-424.000.

Cohen, Sidney; and Schlemmer, Robert, to Improved Lawn Equipment Corporation. Earth working apparatus including aerators and material dispensers. 4,336,760, Cl. 111-11.000.

Cohn, Martin; Jacoby, George V.; and Bates, Charles A., III, to Sperry Corporation. Data encoding method and system employing two-thirds code rate with full word look-ahead. 4,337,458, Cl. 340-347.0DD.

Combustion Research & Technology, Inc.: *See—*
Porter, Kenneth W., 4,336,686, Cl. 60-39.630.

Commercial Shearing, Inc.: *See—*
Singer, Carl M.; Oana, Mateiu J.; and Turko, John D., 4,337,018, Cl. 418-132.000.

Commissariat a l'Energie Atomique: *See—*
Chavand, Jean; Daguenet, Maurice; and Gillet, Rene, 4,337,098, Cl. 148-9.00R.
Vacher, Jacques, 4,337,397, Cl. 250-363.00S.

Commonwealth of Australia, The: *See—*
Thomson, Keith D., 4,336,914, Cl. 244-46.000.

Communications Technology Corporation: *See—*
Smith, Donald J., 4,337,374, Cl. 174-138.00F.

Compagnie Lyonnaise de Transmissions Optiques: *See—*
Tache, Jean-Paul, 4,337,457, Cl. 340-347.0DD.

Compak System, Inc.: *See—*
Penick, Ib; and Volkert, John K., 4,336,664, Cl. 40-594.000.

Comte, Georges N.; Appriou, Andre; and Couturier, Jean, to Les Cables de Lyon. Machine for manufacturing disks on a rod. 4,337,019, Cl. 425-116.000.

Condat, Bernard: *See—*
Bourassin, Lucien; Condat, Bernard; Fortin, Jacques; Leger, Alain; Soto, Joseph; and Solvinto, Jean-Claude, 4,337,480, Cl. 358-93.000.

Congoleum Corporation: *See—*
Varadhachary, Seevaram N., 4,337,296, Cl. 428-420.000.

Connelly, Edward M. Method and system for automated training of manual skills. 4,337,049, Cl. 434-247.000.

Conrow, Ransom B.; and Bernstein, Seymour, to American Cyanamid Company. Modulators of the complement system. 4,337,249, Cl. 424-180.000.

Control Data Corporation: *See—*
Vangen, Robert F., 4,337,463, Cl. 340-825.300.

Cooper, Alan: *See—*
Nagabhushan, Tattanahalli L.; Turner, William N.; and Cooper, Alan, 4,337,335, Cl. 536-13.600.

Cooper, Gordon; and Bryant, Patrick S., to Imperial Chemical Industries Limited. Film tear-tape and packaging film having tear-tape adherent thereto. 4,337,284, Cl. 428-35.000.

Copeland, Terry M., to Du Pont de Nemours, E. I., and Company. Method for making a cathode, and method for lowering hydrogen overvoltage in a chlor-alkali cell. 4,337,127, Cl. 204-98.000.

Corbin Gentry, Inc.: *See—*
Hanagan, Michael W.; and Schoeck, Donald I., 4,336,934, Cl. 272-72.000.

Cordier, Jean A.: *See—*
Rollot, Pierre H.; Cordier, Jean A.; and Briche, Raymond L., 4,336,925, Cl. 266-193.000.

Cornell, Barry F.: *See—*
Helbig, William H.; and Cornell, Barry F., 4,336,844, Cl. 172-140.000.

Cornils, Boy: *See—*
Bahrmann, Helmut; Cornils, Boy; Frohning, Carl D.; and Weber, Jurgen, 4,337,363, Cl. 568-444.000.

Corning Glass Works: *See—*
Rittler, Hermann L., 4,337,295, Cl. 428-410.000.
Coughlin, Vincent D. Vacuum work piece holder. 4,336,765, Cl. 118-50.000.
Coutta, John M. Surveillance system. 4,337,482, Cl. 358-108.000.
Couture, George. Skate blade. 4,336,948, Cl. 280-11.120.
Coutures, Jean L.: *See—*
Berger, Jean L.; and Coutures, Jean L., 4,337,403, Cl. 307-221.00D.
Couturier, Jean: *See—*
Comte, Georges N.; Appriou, Andre; and Couturier, Jean, 4,337,019, Cl. 425-116.000.
Covington Brothers, Inc.: *See—*
Artzer, Richard F., 4,336,676, Cl. 52-309.700.
Cox, Eric R., to Babcock-Moxey Limited. Mechanical handling apparatus for reclaiming material from a stockpile. 4,336,876, Cl. 198-509.000.
Cox, Robert N.; and Rawlings, James E., to UMC Industries, Inc. Article dispensing apparatus. 4,336,892, Cl. 221-125.000.
CR Industries: *See—*
Christiansen, Keith W.; and Vering, Anthony W., 4,336,945, Cl. 277-153.000.
Cragoe, Edward J., Jr.; Stokker, Gerald E.; and Gould, Norman P., to Merck & Co., Inc. [(5,6,9a-Substituted-3-oxo-1,2,9,9a-tetrahydro-3H-fluoren-7-yl)oxy]alkanoic and cycloalkanoic acids, their analogs, esters, salts, and derivatives. 4,337,354, Cl. 562-461.000.
Cragoe, Edward J., Jr.: *See—*
Rooney, Clarence S.; Williams, Haydn W. R.; Cragoe, Edward J., Jr.; and Patchett, Arthur A., 4,337,258, Cl. 424-263.000.
Crankshaw, Michael; and Kucheck, Leo, to Label-Aire Inc. Label applicator with oscillating label receiver and method. 4,337,108, Cl. 156-285.000.
Crawford Collets Limited: *See—*
Franklin, Reginald A., 4,336,947, Cl. 279-46.00A.
Crespi, Giuseppe: *See—*
Bernareggi, Virgilio; Crespi, Giuseppe; and Bugada, Giuseppe, 4,337,272, Cl. 424-316.000.
Crisp, Stephen; and Wilson, Alan D., to National Research Development Corporation. Hardenable compositions. 4,337,186, Cl. 525-362.000.
Cronin, Michael J.; and Elliot, David K., to Lockheed Corporation. Electronic enclosure and articulated back panel for use therein. 4,337,499, Cl. 361-386.000.
Cronkhite, James D.: *See—*
Wilson, Henry E.; Cronkhite, James D.; and Howard, John V., 4,336,868, Cl. 188-376.000.
Crosby, Gary A., to Red Fox Industries Inc. Method and apparatus for pulsed timed control for sludge return line. 4,337,151, Cl. 210-139.000.
Crossley, Roger, to John Wyeth & Brother Limited. Pyridine derivatives. 4,337,259, Cl. 424-263.000.
Crothers, William R. Cart. 4,336,951, Cl. 280-47.260.
Crye, LeRoy D.; and Fischman, Leonard F. Ticket dispenser. 4,336,894, Cl. 221-280.000.
Culph, Kenneth C.: *See—*
Ahearn, James J.; and Culph, Kenneth C., 4,336,793, Cl. 126-450.000.
Cummins, Richard D. Apparatus for supplying corrosion inhibiting material to inaccessible metal surfaces. 4,336,907, Cl. 239-57.000.
Curtis, Richard H., to Hague International. Gas analyzer. 4,336,721, Cl. 73-863.110.
Cuypers, Martinus H.: *See—*
Horowitz, Alexandre; and Cuypers, Martinus H., 4,337,057, Cl. 474-242.000.
Dagiel, Richard T., to Aetna Bearing Company. Unitized bearing assembly. 4,336,972, Cl. 308-233.000.
Daguenet, Maurice: *See—*
Chavand, Jean; Daguenet, Maurice; and Gillet, Rene, 4,337,098, Cl. 148-9.00R.
Dahlgren, Vincent M. F. Device for purifying water. 4,337,136, Cl. 204-242.000.
Daigaku, Masaaki, to Olympus Optical Co., Ltd. Earphone jack for tape recorders. 4,337,383, Cl. 200-51.090.
Dainippon Screen Mfg. Co., Ltd.: *See—*
Komatsubara, Shozi; and Katayama, Masanori, 4,336,984, Cl. 352-75.000.
Dalle Carbonare, Gianbattista, to Honeywell Information Systems Inc. Device for detecting the direction and change of rotational speed of a rotating element. 4,337,497, Cl. 361-239.000.
Dalmas, Edward A., to Villar, Inc. Method of bleaching textile materials. 4,337,060, Cl. 8-111.000.
Daman, Ernest L., to Foster Wheeler Energy Corporation. Integral vapor generator/gasifier system. 4,336,769, Cl. 122-4.00D.
Dauvergne, Hector A. Shock activated shut-off valve. 4,336,818, Cl. 137-38.000.
Davenport, Bobby E.: *See—*
Nix, Edwin L.; and Davenport, Bobby E., 4,336,963, Cl. 296-39.00R.
Davis, Harold L., to Mostek Corporation. On-hook/off-hook detector circuit. 4,337,378, Cl. 179-18.0FA.
Davis, Robert B., to Union Carbide Corporation. Process for delivering liquid cryogen. 4,336,689, Cl. 62-55.000.
Davy McKee Aktiengesellschaft: *See—*
Mahler, Friedrich; and Stauffer, Adolf, 4,337,224, Cl. 422-197.000.
Day, Paul L., to Park-Ohio Industries, Inc. Apparatus for quenching heated workpieces. 4,336,924, Cl. 266-117.000.
De La Rue Systems Limited: *See—*
Hilton, Graham H., 4,337,393, Cl. 235-487.000.
Decker, Henry F. Method for producing ground cover sods. 4,336,668, Cl. 47-58.000.
Deere & Company: *See—*
Friesen, Henry; and Trott, Clarence R., 4,337,015, Cl. 414-686.000.
Deffendall, George W.; and Hitt, James J., to Leeds & Northrup Company. Analog to digital converter with offset error correction. 4,337,456, Cl. 340-347.0NT.
Degussa Aktiengesellschaft: *See—*
Buder, Wolfgang; Wolff, Siegfried; and Kleinschmit, Peter, 4,337,205, Cl. 260-349.000.
Ruhs, Alexander; Schwarz, Rudolf; and Kleinschmit, Peter, 4,337,239, Cl. 423-561.00R.
Deibert, Raymond L. Push-button reversible ratchet and pawl socket wrench handle. 4,336,728, Cl. 81-62.000.
de Korte, Jacob, to Nederlandse Omroep Stichting. Electronic cascade circuit comprising a circuit having controllable transfer characteristics and a two-port. 4,337,440, Cl. 330-129.000.
Del Mar Avionics: *See—*
Anderson, Donald L.; Cherry, Isaac R.; Ripley, John A.; and Tanaka, David T., 4,336,810, Cl. 128-702.000.
Delagrange, Arthur D.; Pryor, Cabell N., Jr.; and Wilson, Wayne D., to United States of America, Navy. Acoustic Doppler detector. 4,337,527, Cl. 367-98.000.
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Maillard, Jacques G.; Delaunay, Pierre P. A.; and Legeai, Jacky M. G., 4,337,343, Cl. 548-152.000.
Dellis, Fred J., to Windblown Systems, Inc. Turbocharger control system. 4,336,688, Cl. 60-602.000.
De Long, Horace J. Poultry processing method and apparatus. 4,336,633, Cl. 17-51.000.
Delta Systems, Inc.: *See—*
Howard, William A., 4,336,778, Cl. 123-334.000.
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Allais, Andre; Clemence, Francois; Meier, Jean; and Deraedt, Roger, 4,337,353, Cl. 562-460.000.
deRosset, Armand J., to UOP Inc. Adsorptive separation of contaminants from naphtha. 4,337,156, Cl. 210-672.000.
deRosset, Armand J.: *See—*
Kulprathipanja, Santi; and deRosset, Armand J., 4,337,171, Cl. 252-430.000.
De Sa, Alvaro; and Luksenberg, Jacob M., to Versa Consultoria Technica LTDA., CGC. Process for the production of fuel alcohol, without vinasse. 4,337,123, Cl. 203-19.000.
De Stevens, George: *See—*
Carney, Richard W. J.; and De Stevens, George, 4,337,264, Cl. 424-274.000.
Deutsche Solvay Werke GmbH: *See—*
Metzner, Wolfgang; Koddebusch, Hubert; and Poetter, Gerswid, deceased, 4,337,093, Cl. 106-18.330.
Diachem, Inc.: *See—*
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Diamond Shamrock Corporation: *See—*
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Gilligan, Thomas J., III; Strempel, Thomas G.; Dorio, Martin M.; and Babinsky, Andrew D., 4,337,126, Cl. 204-98.000.
Solomon, Frank, 4,337,140, Cl. 204-292.000.
Diaz, Joseph; and Guegan, Remy, to C. M. Industries. Process for the preparation of somatostatin. 4,337,194, Cl. 260-112.50S.
Dick, James E., to Phillips Petroleum Company. Lead pressured extraction of carbonaceous material. 4,337,148, Cl. 208-8.0LE.
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Lesher, George Y.; and Dickinson, William B., 4,337,253, Cl. 424-250.000.
Diehr, Hans-Joachim: *See—*
Arold, Hermann; Humburger, Siegbert; Diehr, Hans-Joachim; and Porkert, Helmut, 4,337,359, Cl. 568-21.000.
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Dimitrov, Dimiter N.: *See—*
Petrov, Georgi S.; Petkov, Ivan A.; Etropolski, Hristo I.; Dimitrov, Dimiter N.; Popov, Nikolay N.; and Uzunov, Atanas I., 4,337,078, Cl. 71-24.000.
Dines, Martin B., to Occidental Research Corporation. Regeneration of liquid membrane without breaking emulsion. 4,337,225, Cl. 423-10.000.
Dinkel, Rolf, to Lonza Ltd. Process for the preparation of 3-picoline. 4,337,342, Cl. 546-251.000.
Direct Reduction Corporation, The: *See—*
Keran, Vitie P.; and Baker, Alan C., 4,337,084, Cl. 75-36.000.
Discovision Associates: *See—*
Basilico, Albert R.; and Wilfinger, Raymond J., 4,337,534, Cl. 369-111.000.
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Krug, James E.; Magenau, Roger W.; and Hall, Jack P., 4,336,883, Cl. 206-545.000.
Doi, Shunichi; and Kamogawa, Masatake, to Nitto Chemical Industry Co., Ltd.; and Mitsubishi Rayon Co., Ltd. Process for purifying 2-acrylamido-2-methylpropanesulfonic acid. 4,337,215, Cl. 260-513.00N.
Donahue, Jerome T. Oil reclaiming apparatus having ultraviolet sterilizer therein. 4,337,119, Cl. 196-46.000.
Donlon, Thomas. Self-scoring test with non-disclosed key. 4,337,051, Cl. 434-328.000.
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Dow Chemical Company, The: *See—*
Allada, Sambasiva R., 4,337,321, Cl. 521-143.000.
Ezzell, Bobby R., 4,337,137, Cl. 204-252.000.
Ezzell, Bobby R.; Carl, William P.; and Mod, William A., 4,337,211, Cl. 260-456.00F.
Ramirez, Enrique G., 4,337,175, Cl. 252-455.00R.
Wessling, Ritchie A.; and Pickelman, Dale M., Sr., 4,337,185, Cl. 524-458.000.
Dow Corning Limited: *See—*
Hill, Michael P. L.; and Fridd, Petrina F., 4,337,166, Cl. 252-174.150.
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Schimmel, Karl F.; Seiner, Jerome A.; Dowbenko, Rostyslaw; and Christenson, Roger M., 4,337,184, Cl. 524-726.000.
Doyle, Earl N. Process for the total pre-expansion of polyurethane foam. 4,337,318, Cl. 521-80.000.
Drain, Bob R. Apparatus for curing masonry units. 4,337,033, Cl. 432-197.000.
Drake, Charles A., to Phillips Petroleum Company. Catalyst for hydrogenation of unsaturated dinitriles. 4,337,177, Cl. 252-466.0PT.
Dresser Industries, Inc.: *See—*
Sample, Thomas E., Jr., 4,337,160, Cl. 252-8.50B.
Drummond, Robert A., to McGraw-Edison Company. Application of insulation to ride frame of vacuum fluorescent display. 4,337,411, Cl. 313-497.000.
Drummond, Warren W., to PPG Industries, Inc. Rotary forehearth. 4,337,073, Cl. 65-1.000.
Du Pont Canada Inc.: *See—*
Climenhage, David C.; and Eadie, Walter R., 4,337,188, Cl. 524-140.000.
Duchac, Joseph O.: *See—*
Kopecko, William L.; Fuller, Robert L.; and Duchac, Joseph O., 4,336,730, Cl. 82-4.00A.
Duchesne, Gaston; Laflamme, Marc; and Matte, Denis, to Monitronik Ltee. Mosaic display panel. 4,336,673, Cl. 52-27.000.
Duff, James A.; and Boisvert, Donald R., to Magnetic Peripherals, Inc. Handle assembly, top-load cartridge. 4,336,631, Cl. 16-126.000.
Dunne, Peter F. Eye glass, ring and watch holder. 4,336,887, Cl. 211-13.000.
Duplouy, Alain; and Le Bras, Bernard, to Lafarge Coppee. Device for mixing gaseous fluids by turbulence. 4,337,032, Cl. 432-106.000.
Du Pont de Nemours, E. I., and Company: *See—*
Ahramjian, Leo, 4,337,130, Cl. 204-159.150.
Copeland, Terry M., 4,337,127, Cl. 204-98.000.
Hazan, Isidor, 4,337,187, Cl. 524-504.000.
Durbin, John A.; and Shogren, David K., to Xerox Corporation. Precession scanning system for copier device. 4,336,995, Cl. 355-8.000.
Durr, Rene, to Instruments S.A. High frequency inductive generator for the inductive coil of a plasma generator. 4,337,415, Cl. 315-111.510.
E. R. Squibb & Sons, Inc.: *See—*
Gordon, Eric M.; and Ondetti, Miguel A., 4,337,197, Cl. 260-239.00A.
Petrillo, Edward W., Jr., 4,337,201, Cl. 548-413.000.
Vogt, B. Richard, 4,337,255, Cl. 424-251.000.
Eadie, Walter R.: *See—*
Climenhage, David C.; and Eadie, Walter R., 4,337,188, Cl. 524-140.000.
Eastman Kodak Company: *See—*
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Larkins, Thomas H., Jr., 4,337,351, Cl. 560-263.000.
Eaton Corporation: *See—*
Matthies, Alan A., 4,337,450, Cl. 337-66.000.
Meyer, Lawrence L., 4,336,775, Cl. 123-198.00F.
Morgan, David F., 4,336,687, Cl. 60-384.000.
Smith, Jackson H., 4,337,425, Cl. 318-345.00G.
Eck, Herbert: *See—*
Adler, Klaus; Hafener, Klaus; and Eck, Herbert, 4,337,323, Cl. 524-239.000.
Ecker, Amir L.; and Pietsch, Joseph A., to Atlantic Richfield Company. Dual source heat pump. 4,336,692, Cl. 62-82.000.
Ecomar, Inc.: *See—*
Meek, Robert P., 4,336,709, Cl. 73-61.200.
Ed. Geistlich Sohne AG fur Chemische Industrie: *See—*
Pfirrmann, Rolf W., 4,337,251, Cl. 424-246.000.
Eddy, Clifford O.: *See—*
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Edwards, James D.: *See—*
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Anello, Louis G.; Van Der Puy, Michael; Robinson, Martin A.; and Eibeck, Richard E., 4,337,361, Cl. 568-386.000.
Eisai Co., Ltd.: *See—*
Iwagiri, Susumu; Hattori, Teiichi; Nasu, Teruyoshi, and Miyake, Yasuo, 4,337,246, Cl. 424-174.000.
Eisenstein, Stephen E., to BASF Wyandotte Corporation. Synthetic polymer films and fibers rendered permanently anti-static. 4,336,685, Cl. 57-238.000.
Eistetter, Klaus; and Rapp, Erich, to Byk Gulden Lomberg Chemische Fabrik GmbH. Phenalkoxyalkyl- and phenoxyalkyl-substituted oxiranecarboxylic acids, their use and medicaments containing them. 4,337,267, Cl. 424-278.000.
Eklund, Urban, to Kockums Industri AB. Band sawing machine having means to apply corrective twist to the blade. 4,336,731, Cl. 83-74.000.
Eldridge, John, Jr., to Instranetics, Inc. Medical tubing holder. 4,336,806, Cl. 128-348.000.
Electro Scientific Industries, Inc.: *See—*
Mauck, Michael S., 4,337,442, Cl. 372-13.000.
Electrochemical Technology Corp.: *See—*
Beck, Theodore R.; and Ruggeri, Robert T., 4,336,811, Cl. 128-784.000.
Electronics Diversified, Inc.: *See—*
Flego, Steven E., 4,337,430, Cl. 323-323.000.
Elfab Corporation: *See—*
Norman, Richard O., 4,337,134, Cl. 204-198.000.
Elger, Walter: *See—*
Petzoldt, Karl; Steinbeck , Hermann; and Elger, Walter, 4,337,311, Cl. 435-54.000.
Eli Lilly and Company: *See—*
Zimmerman, Dennis M., 4,337,341, Cl. 546-112.000.
Elkem a/s: *See—*
Haakonsen, Carl; and Thomassen, Thomas, 4,337,128, Cl. 204-107.000.
Elkins, Christopher W.: *See—*
Cammack, Michael A.; Elkins, Christopher W.; Hickman, Clarence J.; and Mullins, Keith M., 4,337,040, Cl. 433-80.000.
Ellestad, Arne; and Tokerud, Arvid, to AB Svenska Flaktfabriken. Method of absorbing sulfur oxides from flue gases in seawater. 4,337,230, Cl. 423-242.000.
Elliot, David K.: *See—*
Cronin, Michael J.; and Elliot, David K., 4,337,499, Cl. 361-386.000.
Elrick, Donald E.; and Gilbert, Harry, to Hercules Incorporated. Composite propellant with differentially cured area at initial burn surface. 4,337,103, Cl. 149-19.900.
El-Shazly, Mohamed F.; and Baker, Kenneth D., to Hooker Chemicals & Plastics Corp. Electroless gold plating. 4,337,091, Cl. 106-1.230.
Eltra Corporation: *See—*
Newberry, Richard D., 4,336,785, Cl. 123-605.000.
Ely, Richard J. Heat exchange turbulator. 4,336,838, Cl. 165-109.00T.
Emerson Electric Co.: *See—*
McElroy, Jerry W.; and Urban, Donald C., 4,337,029, Cl. 431-264.000.
Endicott, Donald L., Jr.: *See—*
Stachiw, Jerry D.; and Endicott, Donald L., Jr., 4,337,105, Cl. 156-87.000.
Endo, Norio; and Nakagami, Tatsuro, to Mitsubishi Jidosha Kogyo Kabushiki Kaisha; and Mitsubishi Denki Kabushiki Kaisha. Fuel feed device for engine. 4,336,782, Cl. 123-494.000.
Energy Development Associates, Inc.: *See—*
Hart, Thomas G., 4,337,237, Cl. 423-486.000.
Engalitcheff, John, Jr., to Baltimore Therapeutic Equipment Company. Method and apparatus for rehabilitation of damaged limbs. 4,337,050, Cl. 434-260.000.
Engelberts, Gerhardus A., to B.V. Machinefabriek Breda v/h Backer & Rueb. Method of enlarging the heat exchange surface of a tubular element. 4,336,642, Cl. 29-157.30A.
English, Joseph J., to Kintz, Earl J., a part interest. Apparatus for removing organic components from an aqueous cleaning solution. 4,337,121, Cl. 202-169.000.
Eppenbach, Lawrence C. Composite tool. 4,336,729, Cl. 81-439.000.
Erdelyi, Attila: *See—*
Almasi, Istvan; Kassai, Ferenc; and Erdelyi, Attila, 4,336,799, Cl. 128-201.240.
Erregierre S.p.A.: *See—*
Gargani, Pietro, 4,337,206, Cl. 260-397.100.
Ervin Industries, Inc.: *See—*
Kwolek, William S., 4,336,672, Cl. 51-432.000.
Erwin Sick GmbH Optik-Electronik: *See—*
Ross, Dieter; and Baumgartner, Viktor, 4,336,997, Cl. 356-4.000.
Esashi, Kiyoyuki; and Minatono, Hisae, to Sumitomo Special Metals Co. Ltd. Microcrystalline thin strip for magnetic material having high permeability, a method of producing the same and articles made from the thin strip. 4,337,087, Cl. 75-124.000.
Escalera, Saul J., to Sherex Chemical Company, Inc. Promoters for use in the anionic circuit of froth flotation of mineral ores. 4,337,149, Cl. 209-166.000.
Eshleman, Ronald J., to Minnesota Mining and Manufacturing Company. Abrasion-resistant transfer laminating sheet material. 4,337,107, Cl. 156-249.000.
Etablissement Public de Diffusion dit "Telediffusion de France": *See—*
Guillou, Louis C., 4,337,483, Cl. 358-114.000.

Etropolski, Hristo I.: *See—*
Petrov, Georgi S.; Petkov, Ivan A.; Etropolski, Hristo I.; Dimitrov, Dimiter N.; Popov, Nikolay N.; and Uzunov, Atanas I., 4,337,078, Cl. 71-24.000.

Euclid Chemical Company, The: *See—*
Tokar, Valery, 4,337,094, Cl. 106-90.000.

Evans, Eric R. Fruit cultivation. 4,336,667, Cl. 47-58.000.

Evenson, William R. Hydraulic sleeve valve and seal arrangement for piston pump. 4,337,017, Cl. 417-516.000.

Exxon Production Research Company: *See—*
Reed, Ronald L.; and Carpenter, Clarence W., Jr., 4,337,159, Cl. 252-8.55D.

Exxon Research & Engineering Co.: *See—*
McCandlish, Larry E.; and Kugler, Irwin L., 4,337,232, Cl. 423-362.000.

Ezzell, Bobby R., to Dow Chemical Company, The. Composite ion exchange membranes. 4,337,137, Cl. 204-252.000.

Ezzell, Bobby R.; Carl, William P.; and Mod, William A., to Dow Chemical Company, The. Fluorocarbon ethers having substituted halogen site(s) and process to prepare. 4,337,211, Cl. 260-456.00F.

Fa. Gebr. Alexander Rheinische Musikinstrumentenfabrik GmbH: *See—*
Alexander, Anton, 4,336,738, Cl. 84-390.000.

Fabrique Nationale Herstal: *See—*
Bourlet, Maurice V., 4,336,742, Cl. 89-34.000.

Factory Mutual Research Corporation: *See—*
Pion, Russell F., 4,336,825, Cl. 137-403.000.

Fairchild, Wayne K. Frictional tensioning device. 4,336,911, Cl. 242-75.400.

Falconbridge Nickel Mines, Ltd.: *See—*
Haakonsen, Carl; and Thomassen, Thomas, 4,337,128, Cl. 204-107.000.

Falconbridge Nikkelverk A/S: *See—*
Haakonsen, Carl; and Thomassen, Thomas, 4,337,128, Cl. 204-107.000.

Falkenberg, Johan C. Corrugated toothed web strip with penetration stoppers for construction elements. 4,337,287, Cl. 428-133.000.

Falkowski, Paul P.; Spotz, Erwin; and Rajadhyaksha, Mangesh, to Square D Company. Method of encapsulating electrical coils. 4,337,219, Cl. 264-130.000.

Farina, Peter R.; and Grattan, James A., to Baker Instruments Corp. Process for preparation of folic acid derivatives. 4,337,339, Cl. 544-257.000.

Farmitalia Carlo Erba S.p.A.: *See—*
Battistini, Carlo; Cassinelli, Giuseppe; Franceschi, Giovanni; Mazzoleni, Rosanna; and Arcamone, Federico, 4,337,248, Cl. 424-180.000.

Farnham, Robert E., to Barber-Greene Company. Method and apparatus for erecting a portable silo and elevator. 4,337,014, Cl. 414-332.000.

Farnum, Sylvia A.: *See—*
Knudson, Curtis L.; Willson, Warrack G.; Baker, Gene G.; Sondreal, Everett A.; and Farnum, Sylvia A., 4,337,142, Cl. 208-8.0LE.

Fattore, Vittorio; Manara, Giovanni; and Notari, Bruno, to Snamprogetti S.p.A. Method for the preparation of ethers. 4,337,366, Cl. 568-698.000.

Favreau, Michel; Bajon, Jean; Cattoen, Michel; Soca, Serge; Longuet, Maurice; and Delattre, Christian, to Thomson-CSF. Device for automatically controlling the transfer function of a video system for improving image perception. 4,337,514, Cl. 364-515.000.

Favstritsky, Nicolai A., to Fiber Industries, Inc. Polyester of parahydroxy benzoic acid, 2,6-naphthalene dicarboxylic acid, terephthalic acid and methylhydroquinone exhibiting improved hydrolytic stability and which is capable of forming an anisotropic melt. 4,337,191, Cl. 524-599.000.

Feldman, Steven, to AMP Incorporated. Apparatus for shearing and crimping. 4,336,646, Cl. 29-564.200.

Ferro Corporation: *See—*
Votava, Werner F., 4,337,316, Cl. 501-21.000.

Festo-Maschinenfabrik Gottlieb Stoll: *See—*
Staiger, Bruno F.; and Stoll, Kurt, 4,336,823, Cl. 137-270.000.

Fiber Industries, Inc.: *See—*
Favstritsky, Nicolai A., 4,337,191, Cl. 524-599.000.

Field, Lamar: *See—*
Byrd, James D.; and Field, Lamar, 4,337,218, Cl. 264-3.00R.

Fielder, Coy M., to Christensen, Inc. Internal fluid screen to prevent nozzle and port plugging. 4,336,850, Cl. 175-393.000.

Fink, Heiner: *See—*
Kahlert, Peter; Dittmann, Norbert; Fink, Heiner; Junker, Frank; Lehmann, Gunter; Schulz, Horst; Johne, Hans; Jentzsch, Arndt; and Kuhnert, Werner, 4,336,969, Cl. 308-61.000.

Firmenich SA: *See—*
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Fischer, Joseph J.: *See—*
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Fischman, Leonard F.: *See—*
Crye, LeRoy D.; and Fischman, Leonard F., 4,336,894, Cl. 221-280.000.

Fiser, Jiri: *See—*
Cerny, Arnost; Fiser, Jiri; Jiruse, Jaroslav; and Sedlak, Vaclav, 4,336,930, Cl. 271-277.000.

Fisher, Donald L.: *See—*
Gootzait, Edward; and Fisher, Donald L., 4,337,030, Cl. 432-14.000.

Flego, Steven E., to Electronics Diversified, Inc. Inductive-load power control circuit. 4,337,430, Cl. 323-323.000.

Fleischer, Helmut: *See—*
Schneider, Erich; Fleischer, Helmut; Nonnenmann, Wolfgang; and Gerum, Benno, 4,337,511, Cl. 364-426.000.

Fletcher, Michael B., to Union Carbide Corporation. Furnace for fusing vanadium pentoxide powder. 4,337,373, Cl. 13-23.000.

Flex-O-Lators. Inc.: *See—*
Mundell, Donald D.; and Tieman, Lloyd E., 4,337,004, Cl. 403-209.000.

Flo-Pac Corporation: *See—*
Pichelman, Franklin D.; and Mehl, Donald N., 4,336,624, Cl. 15-245.000.

Flohr, Peter; and Gumpinger, Franz, to Bayerische Motoren Werke Aktiengesellschaft. Testing device for structural parts and functions of motor vehicles. 4,337,432, Cl. 324-379.000.

Flother, Werner, to Carl Zeiss-Stiftung. Diaphragm control system. 4,336,990, Cl. 354-272.000.

Fluid Controls, Inc.: *See—*
Grawunde, Frederick G., 4,336,826, Cl. 137-540.000.

FMC Corporation: *See—*
Chiang, John S.; and Goldstein, David, 4,337,233, Cl. 423-397.000.
McGrew, Bernard L., 4,336,889, Cl. 212-178.000.
Orlando, Franklin P., 4,336,682, Cl. 56-330.000.

Focke & Co.: *See—*
Focke, Heinz H., 4,336,873, Cl. 198-347.000.

Focke, Heinz H., to Focke & Co. Apparatus for transporting cigarettes from a supply stack to a packaging machine. 4,336,873, Cl. 198-347.000.

Fogel, John D.; and McAdam, Will, to Leeds & Northrup Company. Compensator for slowly responding sensors. 4,337,434, Cl. 328-114.000.

Ford Motor Company: *See—*
Baines, William R., 4,336,741, Cl. 89-7.000.

Forde, Alfredo: *See—*
Forde, Louis; Forde, L. Gregory; Forde, Alonzo; Forde, Alfredo; and Forde, Raymond, 4,336,774, Cl. 123-143.00B.

Forde, Alonzo: *See—*
Forde, Louis; Forde, L. Gregory; Forde, Alonzo; Forde, Alfredo; and Forde, Raymond, 4,336,774, Cl. 123-143.00B.

Forde, L. Gregory: *See—*
Forde, Louis; Forde, L. Gregory; Forde, Alonzo; Forde, Alfredo; and Forde, Raymond, 4,336,774, Cl. 123-143.00B.

Forde, Louis; Forde, L. Gregory; Forde, Alonzo; Forde, Alfredo; and Forde, Raymond. Rotating igniter for engines. 4,336,774, Cl. 123-143.00B.

Forde, Raymond: *See—*
Forde, Louis; Forde, L. Gregory; Forde, Alonzo; Forde, Alfredo; and Forde, Raymond, 4,336,774, Cl. 123-143.00B.

Fortin, Jacques: *See—*
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Foster, Peter D.; and Stowers, Clifford, to Keyes Fibre Company. Contoured molded pulp container with polyester liner. 4,337,116, Cl. 162-158.000.

Foster Wheeler Energy Corporation: *See—*
Daman, Ernest L., 4,336,769, Cl. 122-4.00D.

Fox, Raymond J., to Robertshaw Controls Company. Electrical switch construction, switch blade subassembly and methods of making the same. 4,337,451, Cl. 337-93.000.

Frame, Robert R., to UOP Inc. Catalytic composite and process for use. 4,337,147, Cl. 208-206.000.

Franceschi, Giovanni: *See—*
Battistini, Carlo; Cassinelli, Giuseppe; Franceschi, Giovanni; Mazzoleni, Rosanna; and Arcamone, Federico, 4,337,248, Cl. 424-180.000.

Franke, Werner, to Hoechst Aktiengesellschaft. Process for making relief-type recordings. 4,337,308, Cl. 430-306.000.

Franklin Institute, The: *See—*
Pytlewski, Louis L.; Krevitz, Kenneth; and Smith, Arthur B., 4,337,368, Cl. 568-730.000.

Franklin, Reginald A., to Crawford Collets Limited. Workpiece feed devices. 4,336,947, Cl. 279-46.00A.

Frantz, Virgil L.; and Taylor, Thomas D., to Graham-White Sales Corporation. Solenoid-actuated drain valve. 4,336,821, Cl. 137-187.000.

Fraser, David B.; and Murarka, Shyam P., to Bell Telephone Laboratories, Incorporated. Silicon rich refractory silicides as gate metal. 4,337,476, Cl. 357-67.000.

Frebar Holding AG: *See—*
Lynch, John F., 4,337,152, Cl. 210-197.000.

Freeman, Alfred B., to Texas Instruments Incorporated. Manually controllable data reading apparatus for speech synthesizers. 4,337,375, Cl. 179-1.0SA.

Fridd, Petrina F.: *See—*
Hill, Michael P. L.; and Fridd, Petrina F., 4,337,166, Cl. 252-174.150.

Fried, David L.: *See—*
Hunter, Robert O.; and Fried, David L., 4,337,437, Cl. 330-4.300.

Friesen, Henry; and Trott, Clarence R., to Deere & Company. Parking stand means for tractor-dismounted implement. 4,337,015, Cl. 414-686.000.

Frohning, Carl D.: *See—*
Bahrmann, Helmut; Cornils, Boy; Frohning, Carl D.; and Weber, Jurgen, 4,337,363, Cl. 568-444.000.

Fruehauf Corporation: *See*—
Gill, Charles B., 4,336,877, Cl. 198-509.000.

Fuderer, Andrija, to Union Carbide Corporation. Catalytic steam reforming of hydrocarbons. 4,337,170, Cl. 252-373.000.

Fuji Koeki Corporation: *See*—
Takematsu, Yoshiyuki, 4,337,416, Cl. 315-241.00P.

Fuji Photo Film Co., Ltd.: *See*—
Akao, Mutsuo; and Kashiwagi, Kenzo, 4,337,285, Cl. 428-35.000.
Hiratsuka, Nobuo; Mihara, Yuji; Masuda, Nobuhito; and Miyazako, Takushi, 4,337,065, Cl. 23-230.00B.
Kitajima, Masao; Arai, Fuminori; and Kondo, Asaji, 4,337,222, Cl. 422-56.000.
Mihara, Yuji; Masuda, Nobuhito; Hiratsuka, Nobuo; Miyazako, Takushi, both of; and Ikeda, Tadashi, 4,337,063, Cl. 23-230.00B.
Miyamoto, Akio; Kobayashi, Teruo; and Matsukawa, Hiroharu, 4,337,280, Cl. 427-150.000.
Ohnishi, Masahiro; and Kimura, Tsutomu, 4,337,398, Cl. 250-548.000.
Takenaka, Haruo; Tadokoro, Eiichi; and Fujiyama, Masaaki, 4,337,288, Cl. 428-172.000.

Fuji Sangyo Kabushiki Kaisha: *See*—
Nagashima, Kazuyoshi; and Furuya, Nobuyuki, 4,337,453, Cl. 338-320.000.

Fujikake, Kenji: *See*—
Sugiyama, Katsuhiko; Ohsawa, Katsuyuki; Fujikake, Kenji; and Idota, Yoshinori, 4,336,780, Cl. 123-438.000.

Fujimura, Akira: *See*—
Gotoh, Osamu; Otobe, Yutaka; Kawamoto, Michio; and Fujimura, Akira, 4,336,784, Cl. 123-571.000.

Fujino, Masahiko; Wakimasu, Mitsuhiro; and Kawai, Kiyohisa, to Takeda Chemical Industries, Ltd. Tetrapeptidesemicarbazide derivatives and their production and use. 4,337,247, Cl. 424-177.000.

Fujitsu Fanuc Limited: *See*—
Inagaki, Shigemi; and Nihei, Ryo, 4,336,926, Cl. 269-34.000.

Fujitsu Limited: *See*—
Takahasi, Masauki; Tanaka, Hisami; Yamasawa, Masao; and Ohhata, Michinobu, 4,337,459, Cl. 340-347.0DA.
Yoshimura, Tatsuro, 4,337,433, Cl. 328-55.000.

Fujiyama, Masaaki: *See*—
Takenaka, Haruo; Tadokoro, Eiichi; and Fujiyama, Masaaki, 4,337,288, Cl. 428-172.000.

Fukano, Michio: *See*—
Hojo, Takeshi; and Fukano, Michio, 4,336,967, Cl. 308-2.00A.

Fukatsu, Shunzo: *See*—
Umezawa, Hamao; Umezawa, Sumio; Fukatsu, Shunzo; Yoneta, Toshio; and Wakazawa, Tadashi, 4,337,336, Cl. 536-13.800.

Fukuchi, Shuzo; Hayashi, Tetsuzo; Kobayashi, Hiroya; and Oshiumi, Ryoichi, to Nippon Shokubai Kagaku Kogyo Co., Ltd. Crosslinked composite semipermeable membrane. 4,337,154, Cl. 210-490.000.

Fukushima, Susumu; Munenobu, Hideaki; and Yamade, Kazuhiro, to Tokyo Kikakikai Co., Ltd.; Kansai Chemical Engineering Co., Ltd.; and Takara Shuzo Co., Ltd. Continuous fermentor and reactor. 4,337,315, Cl. 435-313.000.

Fukushima, Yoshio, to Ricoh Co., Ltd. Mark means for adjusting the position of solid-state line image sensor. 4,337,394, Cl. 250-237.00G.

Fuller, Robert L.: *See*—
Kopecko, William L.; Fuller, Robert L.; and Duchac, Joseph O., 4,336,730, Cl. 82-4.00A.

Fuller, Robert T.; and Sanders, Robert J. Holder for stiffly flexible sheets. 4,336,888, Cl. 211-45.000.

Funada, Fumiaki; Matsuura, Masataka; and Wada, Tomio, to Sharp Kabushiki Kaisha. Fluorescent liquid crystal display devices. 4,336,980, Cl. 350-345.000.

Funakoshi, Satoshi: *See*—
Suzuki, Yasushi; Tsukamoto, Kunio; Minami, Nobuyoshi; Hasegawa, Yukio; Satoh, Michitaka; Yamamoto, Norio; Miyasaka, Katsuhiko; Mikami, Takashi; and Funakoshi, Satoshi, 4,337,256, Cl. 424-258.000.

Funken Co., Ltd.: *See*—
Iwako, Hiroyuki, 4,336,851, Cl. 177-16.000.

Furuhashi, Toshio, to Hitachi, Ltd. Apparatus and method for controlling internal combustion engine. 4,337,512, Cl. 364-431.090.

Furuhashi, Toshio, to Hitachi, Ltd. Electronic type engine control method and apparatus. 4,337,513, Cl. 364-431.110.

Furuhata, Hiroshi: *See*—
Ohno, Mitio; Shimada, Yoichi; Furuhata, Hiroshi; Kanno, Ryoichi; Kodaira, Kuniyasu; and Matumoto, Hirozi, 4,336,808, Cl. 128-663.000.

Furui, Hiroshi: *See*—
Tezuka, Hisao; and Furui, Hiroshi, 4,337,380, Cl. 179-146.00E.

Furukawa Denchi Kabushiki Kaisha: *See*—
Takizawa, Yoshihiro, 4,337,302, Cl. 429-181.000.

Furukawa, Tatsuya. Ink jet printing apparatus with variable character size. 4,337,470, Cl. 346-75.000.

Furuya, Nobuyuki: *See*—
Nagashima, Kazuyoshi; and Furuya, Nobuyuki, 4,337,453, Cl. 338-320.000.

Fuzioka, Keizi; and Shinomiya, Masami, to Ohtsu Tire & Rubber Co., Ltd., The. Tubeless pneumatic tires. 4,336,833, Cl. 152-353.00G.

G.D. Societa per Azioni: *See*—
Seragnoli, Enzo, 4,336,812, Cl. 131-84.00R.
Seragnoli, Enzo, 4,336,813, Cl. 131-84.00C.

Gamell, Joseph A., to Joseph Gamell Industries, Inc. Turbo-flywheel-powered vehicle. 4,336,856, Cl. 180-165.000.

Gannaway, Thomas W.: *See*—
Hatch, James E.; and Gannaway, Thomas W., 4,337,048, Cl. 434-219.000.

Garcia, Alberto A. Lathekin. 4,336,706, Cl. 72-479.000.

Gardner, Kenneth L.; Zimmer, William E.; and Miller, Samuel A., to Kennedy Van Saun Corporation. Preheating apparatus. 4,337,031, Cl. 432-98.000.

Garganese, Ugo S.: *See*—
Martin, Raymond H.; Garganese, Ugo S.; and Griffin, John R., 4,337,039, Cl. 433-60.000.

Gargani, Pietro, to Erregierre S.p.A. Process for preparing high purity ursodeoxycholic acid. 4,337,206, Cl. 260-397.100.

Garner, James K., Jr., to Camco, Incorporated. Mechanical tubing anchor. 4,336,841, Cl. 166-216.000.

Garrett Corporation, The: *See*—
Glaser, Jerry, 4,336,649, Cl. 29-598.000.

Garrett, Luther W., Jr., to Alumax, Inc. Process for the production of sulfates. 4,337,228, Cl. 423-114.000.

Gavrilov, Evgeny N.: *See*—
Kulyabko, Valery A.; Sinyavskaya, Vera M.; Sivkov, Alexandr A.; and Gavrilov, Evgeny N., 4,337,008, Cl. 405-127.000.

Gay, Walter A., to Olin Corporation. 5-Amido-3-trihalomethyl-1,2,4-thiadiazoles and their use as herbicides. 4,337,081, Cl. 71-90.000.

Gebr. Hofmann GmbH & Co. KG, Maschinenfabrik: *See*—
Goebel, Eickhart, 4,336,717, Cl. 73-487.000.

Gebrueder Heller, Maschinenfabrik GmbH: *See*—
Schmid, Karlheinz, 4,337,011, Cl. 409-199.000.

Gee, John C.: *See*—
German, Paul M., Jr.; Lamont, James A.; and Gee, John C., 4,337,069, Cl. 55-229.000.

Geigel, Maria A.: *See*—
Marynowski, Chester W.; and Geigel, Maria A., 4,337,213, Cl. 260-502.00R.

General Dynamics Corporation, Electronics Division: *See*—
McArdle, Beryl L.; and Tapernoux, Pierre J., 4,337,436, Cl. 328-157.000.

General Dynamics, Pomona Division: *See*—
Maudal, Inge, 4,337,427, Cl. 318-615.000.

General Electric Company: *See*—
Campbell, Richard W., 4,337,192, Cl. 523-212.000.
Kelly, Peter B., 4,336,937, Cl. 273-51.000.
Kelly, Peter B.; and Heagle, Edward R., 4,337,290, Cl. 428-201.000.
Kelly, Peter B., 4,337,291, Cl. 428-204.000.
Loyzim, Robert J., 4,336,858, Cl. 180-179.000.

George, Lawrence C.: *See*—
McDonald, Hector O.; and George, Lawrence C., 4,337,227, Cl. 423-55.000.

Gerhold, Mark L. C.: *See*—
Spracklen, John E.; and Gerhold, Mark L. C., 4,337,465, Cl. 340-825.030.

German, Paul M., Jr.; Lamont, James A.; and Gee, John C., to Standard Oil Company (Indiana). Gas phase olefin polymerization recycle gas scrubbing tower. 4,337,069, Cl. 55-229.000.

Gerum, Benno: *See*—
Schneider, Erich; Fleischer, Helmut; Nonnenmann, Wolfgang; and Gerum, Benno, 4,337,511, Cl. 364-426.000.

Gesellschaft fur Huttenwerksanlagen mbH: *See*—
Immekus, Karl, 4,336,922, Cl. 266-227.000.

Gestaut, Lawrence J.; and Solomon, Frank, to Diamond Shamrock Corporation. Fluorinated carbon electrode. 4,337,139, Cl. 204-292.000.

GHT Gesellschaft fur Hochtemperaturreaktor-Technik mbH: *See*—
Jager, Walter; and von Waclawiczek, Herbert, 4,337,067, Cl. 48-202.000.

Gilbert, Harry: *See*—
Elrick, Donald E.; and Gilbert, Harry, 4,337,103, Cl. 149-19.900.

Gill, Charles B., to Fruehauf Corporation. Foldable unloading machine. 4,336,877, Cl. 198-509.000.

Gillet, Rene: *See*—
Chavand, Jean; Daguenet, Maurice; and Gillet, Rene, 4,337,098, Cl. 148-9.00R.

Gilligan, Thomas J., III; Strempel, Thomas G.; Dorio, Martin M.; and Babinsky, Andrew D., to Diamond Shamrock Corporation. Electrolysis of carbonates to produce hydroxides. 4,337,126, Cl. 204-98.000.

Gindler, E. Melvin, to Sherwood Medical Industries Inc. Albumin determination method. 4,337,064, Cl. 23-230.00B.

Giolitti, Nicolo', to Arnaldo Vigorelli S.p.A. Electromechanical actuator device for a sewing machine. 4,336,762, Cl. 112-158.00E.

Giordano, Raymond L., to RCA Corporation. Dual output switching circuit. 4,337,423, Cl. 318-280.000.

Giorgetti, Rodolfo: *See*—
Zanazzo, Pietro; Mainardi, Giuliano; and Giorgetti, Rodolfo, 4,337,500, Cl. 361-395.000.

Giovanni, Pastrone, to Oximetrix, Inc. Intravenous metering device. 4,336,800, Cl. 128-214.00F.

Glaser, Jerry, to Garrett Corporation, The. Method of making rotor assembly having anchor with undulating sides. 4,336,649, Cl. 29-598.000.

Glenhope Enterprises, Inc.: *See*—
Laroche, Paul G., 4,336,938, Cl. 273-138.00R.

Goebel, Eickhart, to Gebr. Hofmann GmbH & Co. KG, Maschinenfabrik. Device to clamp a wheel on the shaft of a balancing machine. 4,336,717, Cl. 73-487.000.

Goetzinger, John. Pipe flange. 4,336,958, Cl. 285-55.000.

Goff, Melvin J.: *See*—
Goff, Otis W.; and Goff, Melvin J., 4,336,927, Cl. 269-171.500.

Goff, Otis W.; and Goff, Melvin J. Light-weight jam-clamp and combination. 4,336,927, Cl. 269-171.500.
Gohgi, Kazuaki: *See*—
Nakajima, Kazuhisa; Gohgi, Kazuaki; and Yamamoto, Toshio, 4,337,355, Cl. 562-478.000.
Golan, Kenneth F., to Caterpillar Tractor Co. Valve actuator with hydraulic latching. 4,336,827, Cl. 137-624.270.
Gold Star Semiconductor, Ltd.: *See*—
Kim, Choong-Ki; Kwak, Tae-Kyun; and Choe, Seong-Hyeon, 4,337,475, Cl. 357-36.000.
Goldfarb, Adolph E. Musical game apparatus. 4,336,935, Cl. 273-1.00E.
Goldstein, David: *See*—
Chiang, John S.; and Goldstein, David, 4,337,233, Cl. 423-397.000.
Gomes, John M.: *See*—
Peasley, Edward R.; and Gomes, John M., 4,337,226, Cl. 423-22.000.
Goodman, Murray; Verlander, Michael S.; Jacobson, Kenneth A.; Melmon, Kenneth L.; and Castagnoli, Neal, to University of California, Regents of the. Biologically active catecholamine derivatives. 4,337,207, Cl. 260-404.500.
Gootzait, Edward; and Fisher, Donald L., to Kennedy Van Saun Corporation. Solid fuel fired kiln. 4,337,030, Cl. 432-14.000.
Gordon, Eric M.; and Ondetti, Miguel A., to E. R. Squibb & Sons, Inc. O-sulfated $\beta$-lactam hydroxamic acids and intermediates. 4,337,197, Cl. 260-239.00A.
Gordon, George N. Planting container. 4,336,669, Cl. 47-74.000.
Gorter, Willem K., to U.S. Philips Corporation. Cutting unit for a shaving apparatus. 4,336,650, Cl. 30-34.200.
Gorvin, John H., to Burroughs Wellcome Co. Flukicidal compounds. 4,337,274, Cl. 424-321.000.
Gostl, Georg: *See*—
Schmitt, Georg; and Gostl, Georg, 4,336,694, Cl. 62-374.000.
Gotoh, Osamu; Otobe, Yutaka; Kawamoto, Michio; and Fujimura, Akira, to Honda Giken Kogyo Kabushiki Kaisha. Exhaust gas recirculation control system for engines. 4,336,784, Cl. 123-571.000.
Gould Inc.: *See*—
Kozacka, Frederick J.; and Belcher, Richard A., 4,337,452, Cl. 337-231.000.
Gould, Norman P.: *See*—
Cragoe, Edward J., Jr.; Stokker, Gerald E.; and Gould, Norman P., 4,337,354, Cl. 562-461.000.
Graham, John W.; Sinclair, A. Richard; and Brandt, John L. Method of treating wells using resin-coated particles. 4,336,842, Cl. 166-276.000.
Graham-White Sales Corporation: *See*—
Frantz, Virgil L.; and Taylor, Thomas D., 4,336,821, Cl. 137-187.000.
Graphic Controls Corporation: *See*—
Hubbard, James R.; Sarkisian, George M.; and Scanlon, John J., 4,337,471, Cl. 346-140.00R.
Grattan, James A.: *See*—
Farina, Peter R.; and Grattan, James A., 4,337,339, Cl. 544-257.000.
Grawunde, Frederick G., to Fluid Controls, Inc. Control valve. 4,336,826, Cl. 137-540.000.
Gray, Adrian L. Method of making thermocouples and products thereof. 4,337,221, Cl. 264-102.000.
Gray, Benjamin C. Injection assembly. 4,336,901, Cl. 226-173.000.
Greb, Manfred, to Barmag Barmer Maschinenfabrik AG. Winding device. 4,336,912, Cl. 242-46.400.
Green, Robert D. System for interlocking objects. 4,336,699, Cl. 70-290.000.
Gresh, Peter P. Self-skimming dish rinser. 4,336,620, Cl. 4-639.000.
Grevich, John J., to Nordson Corporation. Stainless steel transport band. 4,336,680, Cl. 53-389.000.
Griffin, John R.: *See*—
Martin, Raymond H.; Garganese, Ugo S.; and Griffin, John R., 4,337,039, Cl. 433-60.000.
Grossman, James M.: *See*—
January, Daniel B.; Grubbs, Dean O.; and Grossman, James M., 4,336,658, Cl. 33-288.000.
Grubbs, Dean O.: *See*—
January, Daniel B.; Grubbs, Dean O.; and Grossman, James M., 4,336,658, Cl. 33-288.000.
Gruber, Wolfgang: *See*—
Batz, Hans-Georg; Rauscher, Elli; Weimann, Gunter; Wahlefeld, August W.; and Gruber, Wolfgang, 4,337,310, Cl. 435-22.000.
Gruenberg, Elliot L., to Broadcom, Incorporated. Communications system and network. 4,337,376, Cl. 179-2.0EB.
Grummett, Lorne H.: *See*—
Melissa, Raymond F.; Grummett, Lorne H.; and Fischer, Joseph J., 4,336,751, Cl. 101-93.040.
Grupp, Bernhard: *See*—
Bock, Erich; Wulfhorst, Burkhard; Hini, Eugen; and Grupp, Bernhard, 4,336,683, Cl. 57-18.000.
Guegan, Remy: *See*—
Diaz, Joseph; and Guegan, Remy, 4,337,194, Cl. 260-112.50S.
Guggenbuhl, Walter; and Halder, Mathis, to LGZ Landis & Gyr Zug AG. Pulse-width modulator circuit. 4,337,438, Cl. 330-10.000.
Guillou, Louis C., to Etablissement Public de Diffusion dit "Telediffusion de France"; and L'Etat Francais, represente par le Secretaire d'Etat aux Poste et Telecommunications (Centre National d'Etudes des Telecommunications). Text video-transmission system provided with means for controlling access to the information. 4,337,483, Cl. 358-114.000.
Guio, Raphael: *See*—
Quinton, Carrol D.; and Guio, Raphael, 4,337,135, Cl. 204-213.000.
Gulf Oil Corporation: *See*—
Antonoplos, Patricia A.; and Heilman, William J., 4,337,110, Cl. 156-307.400.
Karim, Khalid A.; and Rea, James H., 4,337,297, Cl. 428-461.000.
Karim, Khalid A.; Lakshmanan, Pallavoor R.; and Rea, James H., 4,337,298, Cl. 428-461.000.
Gumpinger, Franz: *See*—
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Gunnell, Thomas J., to Phillips Petroleum Company. Rubber covered carbon black pellets. 4,337,294, Cl. 428-407.000.
Gyorgy, Ernst M.: *See*—
Blank, Stuart L.; Gyorgy, Ernst M.; LeCraw, Roy C.; and Luther, Lars C., 4,337,521, Cl. 365-33.000.
Haakonsen, Carl; and Thomassen, Thomas, to Elkem a/s; Falconbridge Nikkelverk A/S; Falconbridge Nickel Mines, Ltd.; and Superior Oil Company, The. Cupric and ferric chloride leach of metal sulphide-containing material. 4,337,128, Cl. 204-107.000.
Haas, Frederick T., Jr. Synthetic turf playing surface with resilient top-dressing. 4,337,283, Cl. 428-17.000.
Hafener, Klaus: *See*—
Adler, Klaus; Hafener, Klaus; and Eck, Herbert, 4,337,323, Cl. 524-239.000.
Hague International: *See*—
Curtis, Richard H., 4,336,721, Cl. 73-863.110.
Hahn, Thomas J. Automatic headlight control system. 4,337,400, Cl. 307-10.0LS.
Haindl Papier GmbH: *See*—
Breunig, Anton, 4,337,150, Cl. 209-237.000.
Haines, Karl A. Method for playing a square forming game. 4,336,941, Cl. 273-240.000.
Halder, Mathis: *See*—
Guggenbuhl, Walter; and Halder, Mathis, 4,337,438, Cl. 330-10.000.
Hale, John C., to United Kingdom Atomic Energy Authority. Eddy current test apparatus for annular welds. 4,337,431, Cl. 324-220.000.
Halikka, Antero: *See*—
Karaila, Ilkka; and Halikka, Antero, 4,337,464, Cl. 340-753.000.
Hall, Alan D., to Lake & Elliot Incorporated. Ball valve. 4,336,919, Cl. 251-214.000.
Hall, Eric B. Compound wing aircraft. 4,336,913, Cl. 244-45.00R.
Hall, Jack P.: *See*—
Krug, James E.; Magenau, Roger W.; and Hall, Jack P., 4,336,883, Cl. 206-545.000.
Hall, John B.: *See*—
Sprecker, Mark A.; and Hall, John B., 4,337,212, Cl. 260-463.000.
Halliburton Company: *See*—
Sullaway, Bob L.; and Treece, Harold O., 4,337,010, Cl. 405-227.000.
Hamada, Seiya: *See*—
Amano, Takehisa; Hamada, Seiya; Isii, Sigeki; and Takeda, Toshio, 4,336,735, Cl. 84-1.170.
Hamatani, Masahide, to Canon Kabushiki Kaisha. Mounting system for optical lens assembly. 4,336,979, Cl. 350-255.000.
Hanagan, Michael W.; and Schoeck, Donald L., to Corbin Gentry, Inc. Rowing exercise machine. 4,336,934, Cl. 272-72.000.
Hanauye, Kunio: *See*—
Shimizu, Yoshiro; Itakura, Toshio; Iwasa, Mitsuhiro; and Hanauye, Kunio, 4,337,334, Cl. 528-137.000.
Hancock, Roger I., to Imperial Chemical Industries Limited. Conductive polymers, fibers made therefrom and process for manufacture. 4,337,331, Cl. 525-429.000.
Handotai Kenkyu Shinkokai: *See*—
Nishizawa, Jun-ichi, 4,337,473, Cl. 357-22.000.
Hannecke, Wolf-Dietrich. Article display stand. 4,336,759, Cl. 108-144.000.
Hanson, Francis V.; Miller, Jan D.; and Oblad, Alex G., to University of Utah. Process for obtaining products from tar sand. 4,337,143, Cl. 208-11.00R.
Hanzlik, Edward W. C., to Xerox Corporation. Variable corrugation vacuum corrugating sheet feeder. 4,336,929, Cl. 271-20.000.
Harada, Tsutomu: *See*—
Maehara, Osamu; and Harada, Tsutomu, 4,336,711, Cl. 73-162.000.
Harbert, Charles A.: *See*—
Welch, Willard M.; and Harbert, Charles A., 4,337,250, Cl. 424-248.570.
Hardigg Industries, Inc.: *See*—
Turner, Edward W.; and Blake, Peter J., 4,337,024, Cl. 425-363.000.
Hardin, Jasper E.: *See*—
Rorer, David L.; and Hardin, Jasper E., 4,337,301, Cl. 429-179.000.
Harlan, Wayne E., to RCA Corporation. Composite timing signal generator with predictable output level. 4,337,478, Cl. 358-20.000.
Harris, Clark E., to Eastman Kodak Company. Latch for a cassette. 4,336,961, Cl. 292-254.000.
Harris, William: *See*—
Hone, Ronald D.; Harris, William; and Edwards, James D., 4,336,626, Cl. 15-319.000.
Harrison, John D., to Raychem Corporation. Heat recoverable nickel/-titanium alloy with improved stability and machinability. 4,337,090, Cl. 148-402.000.
Harsany, John D. Dental wedge. 4,337,041, Cl. 433-149.000.
Hart, LeRoy; and Hart, Mark L. Easy mount picture package. 4,336,884, Cl. 206-575.000.
Hart, Mark L.: *See*—
Hart, LeRoy; and Hart, Mark L., 4,336,884, Cl. 206-575.000.
Hart, Thomas G., to Energy Development Associates, Inc. Catalytically increasing the obtainable concentration of halogen in water. 4,337,237, Cl. 423-486.000.

Hartmannsgruber, Max; and Wolf, Horst, to Zinser Textilmaschinen GmbH. Driving assembly for ring spinning or twisting machine. 4,336,684, Cl. 57-93.000.
Hasegawa, Shinichi: *See—*
Takisawa, Yukihisa; and Hasegawa, Shinichi, 4,337,370, Cl. 568-766.000.
Hasegawa, Yukio: *See—*
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Hashimoto, Shunichi; Oshio, Hiromichi; Mizutani, Masato; Sanemitsu, Yuzuru; Katoh, Haruhiko; and Sumida, Seizo, to Sumitomo Chemical Company, Limited. Herbicidal composition comprising triazinone compound. 4,337,082, Cl. 71-93.000.
Hashimoto, Shunichi: *See—*
Uematsu, Tamon; Hashimoto, Shunichi; and Oshio, Hiromichi, 4,337,357, Cl. 564-154.000.
Hasler, Alfred; and Schuh, Bernhard, to International Memories, Inc.; and Papst-Motoren KG. Brushless D.C. motor assembly. 4,337,491, Cl. 360-97.000.
Hata, Kazuhiko: *See—*
Kanagawa, Shuichi; Nakao, Shinji; Nakai, Kiyoshi; Kamio, Kunimasa; Matsushima, Shunsuke; Hata, Kazuhiko; and Mashita, Kentaro, 4,337,367, Cl. 568-720.000.
Hatanaka, Yasunori: *See—*
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Hatch, James E.; and Gannaway, Thomas W., to Singer Company, The. Career occupation basic skills training system. 4,337,048, Cl. 434-219.000.
Hatta, Koiti, to Sharp Kabushiki Kaisha. Time counter controlled electronic learning aid. 4,337,047, Cl. 434-201.000.
Hattori, Tadashi: *See—*
Yamaguchi, Hiroaki; Hattori, Tadashi; and Ootsuka, Yoshinori, 4,336,707, Cl. 73-35.000.
Hattori, Teiichi: *See—*
Iwagiri, Susumu; Hattori, Teiichi; Nasu, Teruyoshi; and Miyake, Yasuo, 4,337,246, Cl. 424-174.000.
Hawkins, Robert S. Vehicular temperature gauge. 4,336,712, Cl. 374-138.000.
Hayashi, Akira: *See—*
Ando, Hideo; Hayashi, Akira; Ohkouchi, Haruo; and Kitano, Kyozo, 4,337,165, Cl. 252-105.000.
Hayashi Denki Co. Ltd.: *See—*
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Hayashi, Tetsuzo: *See—*
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Hays, Lance G.; Studhalter, Walter R.; and Ritzi, Emil W., to Research-Cottrell Technologies Inc. Refrigeration process using two-phase turbine. 4,336,693, Cl. 62-116.000.
Hazan, Isidor, to Du Pont de Nemours, E. I., and Company. Electrocoating composition with polyhydroxyamine and polyesters or alkyds. 4,337,187, Cl. 524-504.000.
Heagle, Edward R.: *See—*
Kelly, Peter B.; and Heagle, Edward R., 4,337,290, Cl. 428-201.000.
Healy, James W. Vapor recovery jet pump. 4,336,830, Cl. 141-59.000.
Hearon, William M.; and Witte, John F., to Boise Cascade Corporation. Process of making L-gulono gamma lactone. 4,337,202, Cl. 549-314.000.
Heckler & Koch GmbH: *See—*
Horn, Kurt; Muller, Walter; and Schneider, Adolf, 4,336,743, Cl. 89-37.00B.
Heilman, William J.: *See—*
Antonoplos, Patricia A.; and Heilman, William J., 4,337,110, Cl. 156-307.400.
Heimo, Ernest. Holder for light-transmissive pictures. 4,337,505, Cl. 362-125.000.
Heina, Fritz: *See—*
Adam, Axel; and Heina, Fritz, 4,336,862, Cl. 181-200.000.
Helbig, William H.; and Cornell, Barry F., to Lehman-H Feeder & Plow, Inc. Farm implement. 4,336,844, Cl. 172-140.000.
Henk, Hermann: *See—*
Vater, Hans-Joachim; Nickel, Horst; and Henk, Hermann, 4,337,195, Cl. 260-146.00T.
Henson, Walter M. Fuel vaporizer carburetor for internal combustion engine. 4,336,783, Cl. 123-557.000.
Hentschel, Bernhard; Ziebarth, Jurgen; Coenen, Alfred; Kosswig, Kurt; and von Praun, Ferdinand, to Chemische Werke Huls AG. Method for preparing sodium bicarbonate and hydrogen chloride. 4,337,234, Cl. 423-424.000.
Hercules Incorporated: *See—*
Elrick, Donald E.; and Gilbert, Harry, 4,337,103, Cl. 149-19.900.
Hershberger, Donald F.; and Sternberg, Moshe M., to Miles Laboratories, Inc. Immobilization of biocatalysts. 4,337,313, Cl. 435-177.000.
Hershman, George H.: *See—*
Alexander, David H.; Hershman, George H.; Jack, Michael D.; Koda, N. John; and Lloyd, Randahl B., 4,337,395, Cl. 250-332.000.
Hesston Corporation: *See—*
White, Bruce L.; and McWhirt, Bobby D., 4,336,750, Cl. 100-88.000.
Hestermann, Klaus; Maurer, Alexander; Kandler, Joachim; Mietens, Gerhard; and Beumling, Herbert, to Hoechst Aktiengesellschaft. Corrosion-inhibiting pigment and paint composition. 4,337,092, Cl. 106-14.050.
Hibner, David H., to United Technologies Corporation. Viscous/friction damper. 4,336,968, Cl. 308-26.000.
Hickman, Clarence J.: *See—*
Cammack, Michael A.; Elkins, Christopher W.; Hickman, Clarence J.; and Mullins, Keith M., 4,337,040, Cl. 433-80.000.
Hill, Michael P. L.; and Fridd, Petrina F., to Dow Corning Limited. Compositions for treating hair and other fibrous materials. 4,337,166, Cl. 252-174.150.
Hilton, Graham H., to De La Rue Systems Limited. Cassette for banknotes. 4,337,393, Cl. 235-487.000.
Hini, Eugen: *See—*
Bock, Erich; Wulfhorst, Burkhard; Hini, Eugen; and Grupp, Bernhard, 4,336,683, Cl. 57-18.000.
Hinkel, Lester H.; and Chandler, Robert M., to Whirlpool Corporation. Hand washer and drier mounting structure. 4,336,619, Cl. 4-619.000.
Hirano, Takashi, to Yamato Scale Company, Ltd. Combination weighing device. 4,336,852, Cl. 177-25.000.
Hirano, Takashi, to Yamato Scale Company, Ltd. Combination weighing device. 4,336,853, Cl. 177-25.000.
Hiratsuka, Nobuo; Mihara, Yuji; Masuda, Nobuhito; and Miyazako, Takushi, to Fuji Photo Film Co., Ltd. Method for immunological assay using multilayer analysis sheet. 4,337,065, Cl. 23-230.00B.
Hiratsuka, Nobuo: *See—*
Mihara, Yuji; Masuda, Nobuhito; Hiratsuka, Nobuo; Miyazako, Takushi, both of; and Ikeda, Tadashi, 4,337,063, Cl. 23-230.00B.
Hiroshima, Tatsuo; and Sakamoto, Takahide, to Sumitomo Metal Industries, Ltd. Method and apparatus for conditioning of steel surface. 4,337,099, Cl. 148-9.500.
Hiroshima, Tatsuo: *See—*
Shiraiwa, Toshio; Hiroshima, Tatsuo; and Sakamoto, Takahide, 4,336,923, Cl. 266-51.000.
Hirota, Yoshihisa, to Pioneer Electronic Corporation. Tonearm position setting device. 4,337,537, Cl. 369-216.000.
Hirota, Yukitsugu: *See—*
Sone, Masazumi; and Hirota, Yukitsugu, 4,337,408, Cl. 313-130.000.
Hisamitsu Pharmaceutical Co., Inc.: *See—*
Noda, Kanji; Nakagawa, Akira; Motomura, Toshiharu; Tsuji, Masayoshi; Amano, Hidetoshi; and Ide, Hiroyuki, 4,337,270, Cl. 424-310.000.
Hishida, Tadashi. Electric generator. 4,337,405, Cl. 310-43.000.
Hitachi Koki Company, Limited: *See—*
Ito, Koshichi; and Watanabe, Yoshihiko, 4,336,847, Cl. 173-118.000.
Hitachi, Ltd.: *See—*
Akutsu, Eisaku; and Matsuura, Shigeo, 4,337,486, Cl. 358-155.000.
Furuhashi, Toshio, 4,337,512, Cl. 364-431.090.
Furuhashi, Toshio, 4,337,513, Cl. 364-431.110.
Hotta, Atsuo; Kato, Yukio; and Isobe, Teruo, 4,337,523, Cl. 365-194.000.
Kawamura, Takao; and Osakabe, Kuniharu, 4,337,412, Cl. 315-3.000.
Omae, Tsutomu; and Matsuda, Toshihiko, 4,337,509, Cl. 363-128.000.
Sakurai, Mikio; Yoshimoto, Yuichiro; and Kodama, Hiroshi, 4,337,118, Cl. 376-210.000.
Umeda, Jun-ichi; Shimada, Toshikazu; Nakamura, Michiharu; Katayama, Yoshifumi; Kajimura, Takashi; and Yamashita, Shigeo, 4,337,443, Cl. 372-49.000.
Hitachi Maxell, Ltd.: *See—*
Kagano, Shinichi, 4,337,493, Cl. 360-130.330.
Hitt, James J.: *See—*
Deffendall, George W.; and Hitt, James J., 4,337,456, Cl. 340-347.0NT.
Hobgood, Terry W.; and Knox, James C., Jr. Pipeline leak locator. 4,336,708, Cl. 73-40.50R.
Hockney Engineering Pty. Ltd.: *See—*
Hockney, Philip K., 4,337,387, Cl. 219-160.000.
Hockney, Philip K., to Hockney Engineering Pty. Ltd. Backing support strip for welding. 4,337,387, Cl. 219-160.000.
Hodge, Fredrick J.: *See—*
Brookhart, Marshall R.; Hodge, Fredrick J.; and Worden, Thomas J., 4,337,492, Cl. 360-109.000.
Hoechst Aktiengesellschaft: *See—*
Franke, Werner, 4,337,308, Cl. 430-306.000.
Hestermann, Klaus; Maurer, Alexander; Kandler, Joachim; Mietens, Gerhard; and Beumling, Herbert, 4,337,092, Cl. 106-14.050.
Holst, Arno; Perplies, Eberhard; and Buchberger, Gerhard, 4,337,328, Cl. 525-336.000.
Neubauer, Rudolf, 4,337,307, Cl. 430-157.000.
Hoechst-Roussel Pharmaceuticals Inc.: *See—*
Shutske, Gregory M.; Setescak, Linda L.; and Allen, Richard C., 4,337,261, Cl. 424-272.000.
Hofbauer, Rupert: *See—*
Svoboda, Josef; and Hofbauer, Rupert, 4,336,654, Cl. 33-3.00A.
Hoffman, Carl S. Orthopedic pressure appliance and method for controlling development of the maxillary bone. 4,337,036, Cl. 433-5.000.
Hoffmann, Gunter: *See—*
Horz, Eberhard; Wirsing, Robert; and Hoffmann, Gunter, 4,336,816, Cl. 134-110.000.
Hoffmann-La Roche Inc.: *See—*
Baggiolini, Enrico G.; Lee, Hsi L.; and Uskokovic, Milan R., 4,337,345, Cl. 548-242.000.
Szkrybalo, William, 4,337,080, Cl. 71-88.000.
Hojo, Takeshi; and Fukano, Michio, to K.K. Tokyo Keiki. Bearing apparatus. 4,336,967, Cl. 308-2.00A.

Hollis, Jack L., to Carlisle Tire & Rubber Co. Apparatus for making an indefinite length composite sheet of very large predetermined width from indefinite length sheet stock relatively small width. 4,337,112, Cl. 156-351.000.

Holm, Donald C.: *See—*
Mackay, Duncan R.; Arnold, Arthur K.; and Holm, Donald C., 4,337,055, Cl. 474-111.000.

Holst, Arno; Perplies, Eberhard; and Buchberger, Gerhard, to Hoechst Aktiengesellschaft. Acrylic polymers having a high swellability in water. 4,337,328, Cl. 525-336.000.

Holtermann, Theodore J.; and Scharpf, Otto H., to Outboard Marine Corporation. Outboard motor including folded tuned exhaust gas passage. 4,337,054, Cl. 440-89.000.

Holzgrafe, James R., to Ampex Corporation. Analog geometry corrector for television camera image tubes. 4,337,419, Cl. 315-371.000.

Honda Giken Kogyo Kabushiki Kaisha: *See—*
Asaka, Urataro; Uesugi, Naomoto; and Anno, Nobuo, 4,336,864, Cl. 181-241.000.
Gotoh, Osamu; Otobe, Yutaka; Kawamoto, Michio; and Fujimura, Akira, 4,336,784, Cl. 123-571.000.

Hone, Ronald D.; Harris, William; and Edwards, James D., to Scott & Fetzer Company, The. Controlled force safety switch mechanism. 4,336,626, Cl. 15-319.000.

Honeywell Inc.: *See—*
Olson, Harold J., 4,337,401, Cl. 307-39.000.

Honeywell Information Systems Inc.: *See—*
Dalle Carbonare, Gianbattista, 4,337,497, Cl. 361-239.000.

Hooke, Anne M.: *See—*
Oeschger, Max P.; Hooke, Anne M.; and Bellanti, Joseph A., 4,337,314, Cl. 435-253.000.

Hooker Chemicals & Plastics Corp.: *See—*
El-Shazly, Mohamed F.; and Baker, Kenneth D., 4,337,091, Cl. 106-1.230.
Wisnouskas, Joseph S.; and Moritz, Joseph J., 4,337,235, Cl. 423-468.000.

Hoover Company, The: *See—*
Bradshaw, David A.; and Oles, Joseph F., 4,336,628, Cl. 15-415.00R.

Horii, Ichiro: *See—*
Tashiro, Chiaki; and Horii, Ichiro, 4,337,260, Cl. 424-267.000.

Horkey, Edward J. Heat reclaimer. 4,336,836, Cl. 165-47.000.

Horn, Kurt; Muller, Walter; and Schneider, Adolf, to Heckler & Koch GmbH. Gun mount for light automatic weapons. 4,336,743, Cl. 89-37.00B.

Hornady Manufacturing Company: *See—*
Schreiber, Charles J., 4,336,756, Cl. 102-516.000.

Horowitz, Alexandre; and Cuypers, Martinus H., to Varitrac AG. Transmission chain. 4,337,057, Cl. 474-242.000.

Horz, Eberhard; Wirsing, Robert; and Hoffmann, Gunter, to Braun Aktiengesellschaft. Device for cleaning small objects, especially dentures. 4,336,816, Cl. 134-110.000.

Hosono, Nagao: *See—*
Kanbe, Junichiro; Arao, Kozo; and Hosono, Nagao, 4,337,306, Cl. 430-122.000.

Hotta, Atsuo; Kato, Yukio; and Isobe, Teruo, to Hitachi, Ltd. Bipolar memory circuit. 4,337,523, Cl. 365-194.000.

Howard, John V.: *See—*
Wilson, Henry E.; Cronkhite, James D.; and Howard, John V., 4,336,868, Cl. 188-376.000.

Howard, William A., to Delta Systems, Inc. Safety limiter for engine speed. 4,336,778, Cl. 123-334.000.

Hoy, Harold D.: *See—*
MacLean, John P.; Cantwell, J. Edward; Brown, John D.; and Hoy, Harold D., 4,337,068, Cl. 55-1.000.

Hozumi, Shiro: *See—*
Tokumasu, Hiroyuki; Uchino, Hideo; and Hozumi, Shiro, 4,337,097, Cl. 148-6.15R.

Hubbard, James R.; Sarkisian, George M.; and Scanlon, John J., to Graphic Controls Corporation. Disposable markers adapted for constant width and close proximity tracing. 4,337,471, Cl. 346-140.00R.

Huebner, Aronson L.: *See—*
Teague, John R.; and Huebner, Aronson L., 4,337,172, Cl. 252-430.000.

Hug, Max. Earth drilling device for extracting earth samples. 4,336,849, Cl. 175-246.000.

Hughes Aircraft Company: *See—*
Alexander, David H.; Hershman, George H.; Jack, Michael D.; Koda, N. John; and Lloyd, Randahl B., 4,337,395, Cl. 250-332.000.
Leigh, Michael L.; and Stubbs, Richard D., 4,336,740, Cl. 89-1.806.

Hughes Tool Company: *See—*
Bailey, Thomas F., 4,336,840, Cl. 166-77.000.

Hull, Amy B.: *See—*
Cody, Robert D. F.; and Hull, Amy B., 4,337,238, Cl. 423-555.000.

Humburger, Siegbert: *See—*
Arold, Hermann; Humburger, Siegbert; Diehr, Hans-Joachim; and Porkert, Helmut, 4,337,359, Cl. 568-21.000.

Hummert, George T., to Westinghouse Electric Corp. Insulated strand brushes. 4,337,407, Cl. 310-249.000.

Hung, William M.: *See—*
Schmidt, Paul J.; and Hung, William M., 4,337,340, Cl. 544-350.000.

Hunt, Norman, to Associated Engineering Limited. Vehicle speed-control system and actuator device. 4,336,857, Cl. 180-177.000.

Hunter Engineering Company: *See—*
January, Daniel B.; Grubbs, Dean O.; and Grossman, James M., 4,336,658, Cl. 33-288.000.

Hunter, Robert O.; and Fried, David L. High energy laser. 4,337,437, Cl. 330-4.300.

Hurd, Gary L. Lug nut lock. 4,336,698, Cl. 70-231.000.

Huykman, Richard B., to Reliance Electric Company. Automatic bias-controlled VMOS/bipolar dual-triggered switch. 4,337,494, Cl. 361-86.000.

Hydro-Rain, Inc.: *See—*
Karbo, Richard S., 4,336,918, Cl. 251-46.000.

Ichikawa, Iwao: *See—*
Noda, Teruyoshi; Ichikawa, Iwao; and Takahashi, Toshio, 4,336,872, Cl. 193-2.00R.

Ide, Hiroyuki: *See—*
Noda, Kanji; Nakagawa, Akira; Motomura, Toshiharu; Tsuji, Masayoshi; Amano, Hidetoshi; and Ide, Hiroyuki, 4,337,270, Cl. 424-310.000.

Identifax Nationwide Registry: *See—*
Loeb, Warner, 4,336,754, Cl. 101-127.000.

Ido, Kazuo: *See—*
Omi, Yasuo; Wada, Takanori; Sano, Hitoshi; Sato, Shigekatsu; Ido, Kazuo; Taneda, Kozo; and Naka, Junichi, 4,337,021, Cl. 425-142.000.

Idota, Yoshinori: *See—*
Sugiyama, Katsuhiko; Ohsawa, Katsuyuki; Fujikake, Kenji; and Idota, Yoshinori, 4,336,780, Cl. 123-438.000.

Iizuka, Yo: *See—*
Yusa, Haruhiko; Iizuka, Yo; and Akutsu, Humio, 4,337,324, Cl. 525-72.000.

Ikeda, Masashi; and Ito, Shintaro, to Tokyo Shibaura Electric Co., Ltd. Method of forming electrodes on the surface of a semiconductor substrate. 4,337,115, Cl. 156-659.100.

Ikeda, Tadashi: *See—*
Mihara, Yuji; Masuda, Nobuhito; Hiratsuka, Nobuo; Miyazako, Takushi, both of; and Ikeda, Tadashi, 4,337,063, Cl. 23-230.00B.

Imai, Hirosuke; Yamanashi, Teruaki; and Itoh, Hiroyuki, to Nippon Oil Company, Ltd. Anti-migration agent for dyeing. 4,337,062, Cl. 8-557.000.

Imamura, Tomoatsu, to Ricoh Co., Ltd. Stabilized servo motor positioning apparatus. 4,337,426, Cl. 318-599.000.

Immekus, Karl, to Gesellschaft fur Huttenwerksanlagen mbH. Continuously tapped cupola furnace. 4,336,922, Cl. 266-227.000.

Imperial Chemical Industries Limited: *See—*
Bromley, Charles; and Thompson, Morice W., 4,337,189, Cl. 523-332.000.
Cooper, Gordon; and Bryant, Patrick S., 4,337,284, Cl. 428-35.000.
Hancock, Roger I., 4,337,331, Cl. 525-429.000.
Smith, Robert A., 4,337,007, Cl. 405-24.000.

Improved Lawn Equipment Corporation: *See—*
Cohen, Sidney; and Schlemmer, Robert, 4,336,760, Cl. 111-11.000.

Inagaki, Shigemi; and Nihei, Ryo, to Fujitsu Fanuc Limited. Workpiece manipulator. 4,336,926, Cl. 269-34.000.

Inanaga, Takugi: *See—*
Kamimura, Teturo; Komatsubara, Masahiro; Ando, Shizuo; and Inanaga, Takugi, 4,337,490, Cl. 360-96.600.

Industrial Electronic Rubber Company: *See—*
Murray, Myles N., 4,336,920, Cl. 251-357.000.

Industrie-Werke Karlsruhe Augsburg Aktiengesellschaft: *See—*
Kaustrater, Gert, 4,336,744, Cl. 89-40.00K.

Inoue, Akihiko; and Sugiura, Shigekata, to Alps Electric Co., Ltd. Mechanism for preventing the simultaneous locking of push buttons in a push-button switch device. 4,337,382, Cl. 200-5.00E.

Institoris, Laszlo: *See—*
Vidra nee Ildiko, Sandor; and Institoris, Laszlo, 4,337,266, Cl. 424-278.000.

Institut Merieux, S.A.: *See—*
Ayme, Gerard, 4,337,243, Cl. 424-92.000.

Instranetics, Inc.: *See—*
Eldridge, John, Jr., 4,336,806, Cl. 128-348.000.

Instruments S.A.: *See—*
Durr, Rene, 4,337,415, Cl. 315-111.510.

International Flavors & Fragrances Inc.: *See—*
Kiwala, Jacob; Tokarzewski, Richard J.; Schmitt, Frederick L.; and Sprecker, Mark A., 4,337,180, Cl. 252-522.00R.
Sprecker, Mark A.; and Hall, John B., 4,337,212, Cl. 260-463.000.

International Harvester Co.: *See—*
Boetto, Charles, 4,336,846, Cl. 172-776.000.

International Memories, Inc.: *See—*
Hasler, Alfred; and Schuh, Bernhard, 4,337,491, Cl. 360-97.000.

Internationale Octrooi Maatschappij "Octropa" B.V.: *See—*
Akers, John B.; Littler, Jane A.; and Peters, David C., 4,337,209, Cl. 260-417.000.

Inui, Taiji: *See—*
Oki, Toshikazu; Yoshimoto, Akihiro; Kouno, Kageaki; Inui, Taiji; Takeuchi, Tomio; and Umezawa, Hamao, 4,337,312, Cl. 435-78.000.

Iowa State University Research Foundation, Inc.: *See—*
Cody, Robert D. F.; and Hull, Amy B., 4,337,238, Cl. 423-555.000.

IPCO Corporation: *See—*
Weissman, Bernard, 4,337,043, Cl. 433-225.000.

Ishida, Hideo: *See—*
Uejo, Hirozo; Ishida, Hideo; and Shinhama, Masaaki, 4,337,179, Cl. 252-511.000.

Ishiguro, Keiko: *See*—
Ishiguro, Yoshihiko; Ishiguro, Keiko; and Shiotani, Hiromi, 4,336,636, Cl. 24-115.00M.
Ishiguro, Yoshihiko; Ishiguro, Keiko; and Shiotani, Hiromi. Fastening device. 4,336,636, Cl. 24-115.00M.
Ishihara, Toshinobu; Yamamoto, Akira; and Taguchi, Kenichi, to Shin-Etsu Chemical Company Limited. Method for the cis to trans isomerization of an alkenol. 4,337,372, Cl. 568-906.000.
Ishikura, Tomoyuki: *See*—
Yoshioka, Takeo; Yamamoto, Kenichi; Yamada, Kaoru; Kato, Yasuyuki; Shimauchi, Yasutaka; and Ishikura, Tomoyuki, 4,337,199, Cl. 260-245.20T.
Isii, Sigeki: *See*—
Amano, Takehisa; Hamada, Seiya; Isii, Sigeki; and Takeda, Toshio, 4,336,735, Cl. 84-1.170.
Isobe, Takashi, to Canon Kabushiki Kaisha. Exposure mode change-over device for interchangeable lens mounting. 4,336,991, Cl. 354-286.000.
Isobe, Teruo: *See*—
Hotta, Atsuo; Kato, Yukio; and Isobe, Teruo, 4,337,523, Cl. 365-194.000.
Itaba, Takeshi; and Matsumoto, Shotaro, to Mitsubishi Kinzoku Kabushiki Kaisha. Surface-coated blade member for cutting tools and process for producing same. 4,337,300, Cl. 428-627.000.
Itakura, Toshio: *See*—
Shimizu, Yoshiro; Itakura, Toshio; Iwasa, Mitsuhiro; and Hanauye, Kunio, 4,337,334, Cl. 528-137.000.
Ito, Koshichi; and Watanabe, Yoshihiko, to Hitachi Koki Company, Limited. Percussion drill. 4,336,847, Cl. 173-118.000.
Ito, Shintaro: *See*—
Ikeda, Masashi; and Ito, Shintaro, 4,337,115, Cl. 156-659.100.
Ito, Yasuro; Kaga, Hideharu; Yamamoto, Yasuhiro; and Sumita, Tadayuki, to Ito, Yasuro; and Taisei Corporation. Method and apparatus for manufacturing articles of hydraulic substances. 4,337,020, Cl. 425-129.00R.
Itoh, Hiroyuki: *See*—
Imai, Hirosuke; Yamanashi, Teruaki; and Itoh, Hiroyuki, 4,337,062, Cl. 8-557.000.
Iwagiri, Susumu; Hattori, Teiichi; Nasu, Teruyoshi; and Miyake, Yasuo, to Eisai Co., Ltd. Solid preparation comprising cobamamide or mecobalamin. 4,337,246, Cl. 424-174.000.
Iwako, Hiroyuki, to Funken Co., Ltd. Loop conveyor type flow weigher. 4,336,851, Cl. 177-16.000.
Iwasa, Mitsuhiro: *See*—
Shimizu, Yoshiro; Itakura, Toshio; Iwasa, Mitsuhiro; and Hanauye, Kunio, 4,337,334, Cl. 528-137.000.
Iwasaki, Shinichiro, to Aisin Seiki Company, Limited. Position sensor. 4,336,657, Cl. 33-174.00L.
Iwata Electric Co., Ltd.: *See*—
Iwata, Keisuke, 4,337,454, Cl. 340-63.000.
Iwata, Hiroshi; Yamaoka, Tetsuo; and Morioka, Akitoshi, to West Electric Co., Ltd. Camera with macro-photographic system. 4,336,985, Cl. 354-145.000.
Iwata, Keisuke, to Iwata Electric Co., Ltd. Alarm unit for preventing theft of vehicles. 4,337,454, Cl. 340-63.000.
Jack, Michael D.: *See*—
Alexander, David H.; Hershman, George H.; Jack, Michael D.; Koda, N. John; and Lloyd, Randahl B., 4,337,395, Cl. 250-332.000.
Jackson, Jay W., to Regal International, Inc. Marine landing structure with omni directional energy absorbing characteristics. 4,337,009, Cl. 405-212.000.
Jacobson, Kenneth A.: *See*—
Goodman, Murray; Verlander, Michael S.; Jacobson, Kenneth A.; Melmon, Kenneth L.; and Castagnoli, Neal, 4,337,207, Cl. 260-404.500.
Jacobson, Martin, to United States of America, Agriculture. Erythro-9,10-Dihydroxyoctadecan-1-ol acetate a boll weevil anti-feedant. 4,337,271, Cl. 424-311.000.
Jacoby, George V.: *See*—
Cohn, Martin; Jacoby, George V.; and Bates, Charles A., III, 4,337,458, Cl. 340-347.0DD.
Jager, Walter; and von Waclawiczek, Herbert, to GHT Gesellschaft fur Hochtemperaturreaktor-Technik mbH. Coal gasification. 4,337,067, Cl. 48-202.000.
Jahnke, Otto C.: *See*—
Payne, David A.; Park, Sang M.; and Jahnke, Otto C., 4,337,162, Cl. 252-62.3BT.
January, Daniel B.; Grubbs, Dean O.; and Grossman, James M., to Hunter Engineering Company. Method of effecting compensation of cooperatively coupled vehicle wheel aligner instruments. 4,336,658, Cl. 33-288.000.
Jardinier, Pierre; and Simonnot, Jack, to Societe d'Etudes et de Recherches de Ventilation et d'Aeraulique S.E.R.V.A. Delivery stabilizer for ventilation shaft. 4,336,904, Cl. 236-92.00R.
Jarvis, Grover F., Jr.; and Arold, George E., to Rose Truck and Caster Company. Caster swivel lock. 4,336,629, Cl. 16-35.00R.
Jaspon, Lawrence E. Tire filling composition. 4,337,322, Cl. 523-166.000.
Jensen, William F. Weighing system. 4,336,854, Cl. 177-210.00R.
Jentzsch, Arndt: *See*—
Kahlert, Peter; Dittmann, Norbert; Fink, Heiner; Junker, Frank; Lehmann, Gunter; Schulz, Horst; Johne, Hans; Jentzsch, Arndt; and Kuhnert, Werner, 4,336,969, Cl. 308-61.000.
Jin, Sungho, to Bell Telephone Laboratories, Incorporated. Magnetically anisotropic alloys for magnetically actuated devices. 4,337,100, Cl. 148-31.550.
Jiruse, Jaroslav: *See*—
Cerny, Arnost; Fiser, Jiri; Jiruse, Jaroslav; and Sedlak, Vaclav, 4,336,930, Cl. 271-277.000.
John Wyeth & Brother Limited: *See*—
Crossley, Roger, 4,337,259, Cl. 424-263.000.
Johne, Hans: *See*—
Kahlert, Peter; Dittmann, Norbert; Fink, Heiner; Junker, Frank; Lehmann, Gunter; Schulz, Horst; Johne, Hans; Jentzsch, Arndt; and Kuhnert, Werner, 4,336,969, Cl. 308-61.000.
Johnson, Bruce K., to Polaroid Corporation. Camera with lens disc drive system. 4,336,988, Cl. 354-197.000.
Johnson, James C., to Westinghouse Electric Corp. Starting and operating apparatus for high-pressure sodium lamps. 4,337,417, Cl. 315-290.000.
Johnson & Johnson Baby Products Company: *See*—
Repke, Virginia L., 4,336,803, Cl. 128-287.000.
Johnson, Roy A.; Lincoln, Frank H.; and Pike, John E., to Upjohn Company, The. $PGI_2$ Lower alkyl esters. 4,337,204, Cl. 549-465.000.
Jones, Addison B., to Rockwell International Corporation. Ion etching process with minimized redeposition. 4,337,132, Cl. 204-192.00E.
Jones, Frank; and Tomlinson, Peter, to Jones and Healy Marine Limited. Navigation training aids. 4,337,045, Cl. 434-29.000.
Jones and Healy Marine Limited: *See*—
Jones, Frank; and Tomlinson, Peter, 4,337,045, Cl. 434-29.000.
Jorgensen, Richard G.; and Steele, Gerald G., to Parker-Hannifin Corporation. Metering device for adding one fluid to another. 4,336,820, Cl. 137-100.000.
Joseph Gamell Industries, Inc.: *See*—
Gamell, Joseph A., 4,336,856, Cl. 180-165.000.
Joyce, Michael F. Carriers for containers, apparatus and method for applying same to containers. 4,336,898, Cl. 294-87.280.
Judd, Frank F.; and Westerman, George R., to Bell Telephone Laboratories, Incorporated. Bubble memory driver. 4,337,520, Cl. 365-6.000.
Judson, Carl, Jr. Milling apparatus. 4,336,910, Cl. 241-246.000.
Juhl, Barker J. Lockable or free-wheeling device insertable between a driven vehicle-wheel and its axle connector. 4,337,003, Cl. 403-1.000.
July, Mark E. Rapid-response water heating and delivery system. 4,337,388, Cl. 219-309.000.
Junggren, Ulf K.; and Sjostrand, Sven E., to Aktiebolaget Hassle. Gastric acid secretion inhibiting substituted 2-(2-benzimidazolyl)-pyridines, their preparation, pharmaceutical preparations containing same, and method for inhibiting gastric acid secretion. 4,337,257, Cl. 424-263.000.
Junker, Frank: *See*—
Kahlert, Peter; Dittmann, Norbert; Fink, Heiner; Junker, Frank; Lehmann, Gunter; Schulz, Horst; Johne, Hans; Jentzsch, Arndt; and Kuhnert, Werner, 4,336,969, Cl. 308-61.000.
Junkers, John K. Hydraulic wrench for limited space application. 4,336,727, Cl. 81-57.390.
Kabushiki Kaisha Aiwa: *See*—
Ando, Ryuta; and Kinugawa, Kazumi, 4,337,533, Cl. 369-77.000.
Kabushiki Kaisha Kawai Gakki Seisakusho: *See*—
Mishima, Toshio, 4,336,736, Cl. 84-1.260.
Kabushiki Kaisha Komatsu Seisakusho: *See*—
Tsutsumi, Yoshio, 4,336,869, Cl. 192-13.00R.
Kabushiki Kasiha Toyota Chuo Kenkyusho: *See*—
Sugiyama, Katsuhiko; Ohsawa, Katsuyuki; Fujikake, Kenji; and Idota, Yoshinori, 4,336,780, Cl. 123-438.000.
K.K. Tokyo Keiki: *See*—
Hojo, Takeshi; and Fukano, Michio, 4,336,967, Cl. 308-2.00A.
Kaga, Hideharu: *See*—
Ito, Yasuro; Kaga, Hideharu; Yamamoto, Yasuhiro; and Sumita, Tadavuki, 4,337,020, Cl. 425-129.00R.
Kagano, Shnichi, to Hitachi Maxell, Ltd. Magnetic recording tape cartridge. 4,337,493, Cl. 360-130.330.
Kahlert, Peter; Dittmann, Norbert; Fink, Heiner; Junker, Frank; Lehmann, Gunter; Schulz, Horst; Johne, Hans; Jentzsch, Arndt; and Kuhnert, Werner, to VEB Kombinat Polygraph "Werner Lamberz", Leipzig. Journal bearing. 4,336,969, Cl. 308-61.000.
Kai, Toshio: *See*—
Tanaka, Junzo; and Kai, Toshio, 4,337,384, Cl. 219-10.55B.
Kajimura, Takashi: *See*—
Umeda, Jun-ichi; Shimada, Toshikazu; Nakamura, Michiharu; Katayama, Yoshifumi; Kajimura, Takashi; and Yamashita, Shigeo, 4,337,443, Cl. 372-49.000.
Kakugo, Masahiro: *See*—
Shiga, Akinobu; Kakugo, Masahiro; Sadatoshi, Hajime; Wakamatsu, Kazuki; and Yoshioka, Hiroshi, 4,337,326, Cl. 525-244.000.
Kalmanash, Michael H., to United Technologies Corporation. Dual mode color switch for beam penetration CRT. 4,337,420, Cl. 315-375.000.
Kalmanash, Michael H., to United Technologies Corporation. Sequential color switch for beam penetration CRT. 4,337,421, Cl. 315-375.000.
Kamimura, Teturo; Komatsubara, Masahiro; Ando, Shizuo; and Inanaga, Takugi, to Pioneer Electronic Corporation. Cassette tape player. 4,337,490, Cl. 360-96.600.
Kamio, Kunimasa: *See*—
Kanagawa, Shuichi; Nakao, Shinji; Nakai, Kiyoshi; Kamio, Kunimasa; Matsushima, Shunsuke; Hata, Kazuhiko; and Mashita, Kentaro, 4,337,367, Cl. 568-720.000.

Kamogawa, Masatake: *See*—
Doi, Shunichi; and Kamogawa, Masatake, 4,337,215, Cl. 260-513.00N.

Kamphues, Hermann, to C. Keller GmbH & Co., KG, Maschinenfabrik. Setting machine for spacing formed articles. 4,336,874, Cl. 198-458.000.

Kanagawa, Shuichi; Nakao, Shinji; Nakai, Kiyoshi; Kamio, Kunimasa; Matsushima, Shunsuke; Hata, Kazuhiko; and Mashita, Kentaro, to Sumitomo Chemical Company, Limited. Oligomer of m-isopropenylphenol. 4,337,367, Cl. 568-720.000.

Kanbe, Junichiro; Arao, Kozo; and Hosono, Nagao, to Canon Kabushiki Kaisha. Developing method in which a bias is adjustable in accordance with a latent image and an apparatus therefor. 4,337,306, Cl. 430-122.000.

Kandler, Joachim: *See*—
Hestermann, Klaus; Maurer, Alexander; Kandler, Joachim; Mietens, Gerhard; and Beumling, Herbert, 4,337,092, Cl. 106-14.050.

Kaneko, Takayuki; and Ninagawa, Sadami, to Toyo Engineering Corporation. Waste heat boiler. 4,336,770, Cl. 122-266.000.

Kaneuchi, Yoichiro: *See*—
Yanagihara, Masanobu; Kaneuchi, Yoichiro; and Kobayashi, Shoji, 4,336,777, Cl. 123-306.000.

Kanno, Ryoichi: *See*—
Ohno, Mitio; Shimada, Yoichi; Furuhata, Hiroshi; Kanno, Ryoichi; Kodaira, Kuniyasu; and Matumoto, Hirozi, 4,336,808, Cl. 128-663.000.

Kansai Chemical Engineering Co., Ltd.: *See*—
Fukushima, Susumu; Munenobu, Hideaki; and Yamade, Kazuhiro, 4,337,315, Cl. 435-313.000.

Karaila, Ilkka; and Halikka, Antero, to Valmet Oy. Method and circuit for controlling a band display of a plurality of analog signals using a single anode type bar graph device. 4,337,464, Cl. 340-753.000.

Karbo, Richard S., to Hydro-Rain, Inc. Diaphragm valve with multiple pivot axis valve element. 4,336,918, Cl. 251-46.000.

Karim, Khalid A.; and Rea, James H., to Gulf Oil Corporation. Coextrudable thermoplastic compositions and bonds and laminates therefrom. 4,337,297, Cl. 428-461.000.

Karim, Khalid A.; Lakshmanan, Pallavoor R.; and Rea, James H., to Gulf Oil Corporation. Polymer compositions and laminates produced by bonding or coextrusion. 4,337,298, Cl. 428-461.000.

Karkkainen, Alpo: *See*—
Baltscheffsky, Arne; and Karkkainen, Alpo, 4,336,700, Cl. 70-366.000.

Karl August Heimsoth Industrie: *See*—
Barchi, Rolfo, 4,337,035, Cl. 432-246.000.

Kashiwagi, Kenzo: *See*—
Akao, Mutsuo; and Kashiwagi, Kenzo, 4,337,285, Cl. 428-35.000.

Kassai, Ferenc: *See*—
Almasi, Istvan; Kassai, Ferenc; and Erdelyi, Attila, 4,336,799, Cl. 128-201.240.

Katayama, Masanori: *See*—
Komatsubara, Shozi; and Katayama, Masanori, 4,336,984, Cl. 352-75.000.

Katayama, Yoshifumi: *See*—
Umeda, Jun-ichi; Shimada, Toshikazu; Nakamura, Michiharu; Katayama, Yoshifumi; Kajimura, Takashi; and Yamashita, Shigeo, 4,337,443, Cl. 372-49.000.

Kato, Yasuyuki: *See*—
Yoshioka, Takeo; Yamamoto, Kenichi; Yamada, Kaoru; Kato, Yasuyuki; Shimauchi, Yasutaka; and Ishikura, Tomoyuki, 4,337,199, Cl. 260-245.20T.

Kato, Yukio: *See*—
Hotta, Atsuo; Kato, Yukio; and Isobe, Teruo, 4,337,523, Cl. 365-194.000.

Katoh, Haruhiko: *See*—
Hashimoto, Shunichi; Oshio, Hiromichi; Mizutani, Masato; Sanemitsu, Yuzuru; Katoh, Haruhiko; and Sumida, Seizo, 4,337,082, Cl. 71-93.000.

Kauffman, Ivan L.: *See*—
Allen, Robert J.; and Kauffman, Ivan L., 4,337,059, Cl. 493-184.000.

Kauffman, Karl C.; and Kaufman, Martin H., to United States of America, Navy. Method of obtaining strong and durable adhesion to rubber through chemical covalent bonds. 4,337,111, Cl. 156-307.500.

Kaufman, Martin H.: *See*—
Kauffman, Karl C.; and Kaufman, Martin H., 4,337,111, Cl. 156-307.500.

Kaustrater, Gert, to Industrie-Werke Karlsruhe Augsburg Aktiengesellschaft. Armored vehicle. 4,336,744, Cl. 89-40.00K.

Kawai, Kiyohisa: *See*—
Fujino, Masahiko; Wakimasu, Mitsuhiro; and Kawai, Kiyohisa, 4,337,247, Cl. 424-177.000.

Kawamoto, Michio: *See*—
Gotoh, Osamu; Otobe, Yutaka; Kawamoto, Michio; and Fujimura, Akira, 4,336,784, Cl. 123-571.000.

Kawamura, Takao; and Osakabe, Kuniharu, to Hitachi, Ltd. Cathode device for cathode-ray tube. 4,337,412, Cl. 315-3.000.

Kaye, Saul, to Ben Venue Laboratories, Inc. Sterilizing apparatus incorporating recirculation of chamber atmosphere. 4,337,223, Cl. 422-112.000.

Kellogg, James R., to Tektronix, Inc. Supply-voltage driver for a differential amplifier. 4,337,441, Cl. 330-261.000.

Kelly, Peter B., to General Electric Company. Hardboard-bonded melamine overlaid surface for bowling lane. 4,336,937, Cl. 273-51.000.

Kelly, Peter B.; and Heagle, Edward R., to General Electric Company. High impact resistant laminate surface for a bowling lane. 4,337,290, Cl. 428-201.000.

Kelly, Peter B., to General Electric Company. Decorative laminate surface for bowling lane surface having reduced gloss. 4,337,291, Cl. 428-204.000.

Kendall Company, The: *See*—
Shah, Kishore R., 4,337,325, Cl. 525-205.000.

Kennecott Corporation: *See*—
Cichy, Paul, 4,337,085, Cl. 75-83.00R.

Kennedy Van Saun Corporation: *See*—
Gardner, Kenneth L.; Zimmer, William E.; and Miller, Samuel A., 4,337,031, Cl. 432-98.000.
Gootzait, Edward; and Fisher, Donald L., 4,337,030, Cl. 432-14.000.

Keran, Vitie P.; and Baker, Alan C., to Direct Reduction Corporation, The. System for recycling char in iron oxide reducing kilns. 4,337,084, Cl. 75-36.000.

Keyes Fibre Company: *See*—
Foster, Peter D.; and Stowers, Clifford, 4,337,116, Cl. 162-158.000.

Keystone Foods Corporation: *See*—
Adams, Edward G., 4,337,275, Cl. 426-104.000.

Kidd, Patrick D.: *See*—
Orlowski, Jan A.; Butler, David V.; and Kidd, Patrick D., 4,337,349, Cl. 560-30.000.

Kiff, Ben W.: *See*—
Logsdon, John E.; and Kiff, Ben W., 4,337,356, Cl. 562-549.000.

Kilty, Alan L., to Caterpillar Tractor Co. Welder control. 4,337,386, Cl. 219-130.210.

Kim, Choong-Ki; Kwak, Tae-Kyun; and Choe, Seong-Hyeon, to Gold Star Semiconductor, Ltd. High power transistor with highly doped buried base layer. 4,337,475, Cl. 357-36.000.

Kimberly-Clark Corporation: *See*—
Roeder, Robert J., 4,336,804, Cl. 128-290.00R.

Kimura, Tsutomu: *See*—
Ohnishi, Masahiro; and Kimura, Tsutomu, 4,337,398, Cl. 250-548.000.

Kindell, Bo, to ASEA Aktiebolag. Apparatus for firing series-connected thyristors. 4,337,404, Cl. 307-252.00L.

Kinetico, Inc.: *See*—
Prior, William C., 4,337,153, Cl. 210-288.000.

King, Timothy W.: *See*—
Sahyun, Melville R. V.; Chen, Tsung-I; King, Timothy W.; Mikelsons, Valdis; and Mitra, Smarajit, 4,337,303, Cl. 430-11.000.

King, Vincent W.: *See*—
Lauer, James L.; King, Vincent W.; and Lau, Keyser K., 4,337,396, Cl. 250-340.000.

Kintz, Earl J.: *See*—
English, Joseph J., 4,337,121, Cl. 202-169.000.

Kinugawa, Kazumi: *See*—
Ando, Ryuta; and Kinugawa, Kazumi, 4,337,533, Cl. 369-77.000.

Kitabayashi, Seiichi. Wave energy propelling marine ship. 4,337,052, Cl. 440-9.000.

Kitajima, Masao; Arai, Fuminori; and Kondo, Asaji, to Fuji Photo Film Co., Ltd. Hemoglobin concentration determining article. 4,337,222, Cl. 422-56.000.

Kitani, Teruo: *See*—
Sagishima, Takayuki; and Kitani, Teruo, 4,337,477, Cl. 358-18.000.

Kitano, Kyozo: *See*—
Ando, Hideo; Hayashi, Akira; Ohkouchi, Haruo; and Kitano, Kyozo, 4,337,165, Cl. 252-105.000.

Kitchhen, John A. Pulse combustion apparatus. 4,336,791, Cl. 126-110.00R.

Kiwala, Jacob; Tokarzewski, Richard J.; Schmitt, Frederick L.; and Sprecker, Mark A., to International Flavors & Fragrances Inc. Use of cyclohexyl phenethylether in augmenting or enhancing the aroma of perfumes and colognes. 4,337,180, Cl. 252-522.00R.

Klamm, Robert L.: *See*—
Carouthers, Middleton M.; and Klamm, Robert L., 4,336,773, Cl. 123-25.00B.

Kleinschmit, Peter: *See*—
Buder, Wolfgang; Wolff, Siegfried; and Kleinschmit, Peter, 4,337,205, Cl. 260-349.000.
Ruhs, Alexander; Schwarz, Rudolf; and Kleinschmit, Peter, 4,337,239, Cl. 423-561.00R.

Kling, Alfred: *See*—
Rohlfs, Hans-Adolf; Kling, Alfred; Raab, Guenter; Vogt, Michael; Specht, Viktor; and Schaetzke, Ulrike, 4,337,214, Cl. 260-502.500.

Knox, James C., Jr.: *See*—
Hobgood, Terry W.; and Knox, James C., Jr., 4,336,708, Cl. 73-40.50R.

Knudson, Curtis L.; Willson, Warrack G.; Baker, Gene G.; Sondreal, Everett A.; and Farnum, Sylvia A., to United States of America, Energy. Continuous process for conversion of coal. 4,337,142, Cl. 208-8.0LE.

Kobayashi, Hiroya: *See*—
Fukuchi, Shuzo; Hayashi, Tetsuzo; Kobayashi, Hiroya; and Oshiumi, Ryoichi, 4,337,154, Cl. 210-490.000.

Kobayashi, Shoji: *See*—
Yanagihara, Masanobu; Kaneuchi, Yoichiro; and Kobayashi, Shoji, 4,336,777, Cl. 123-306.000.

Kobayashi, Teruo: *See*—
Miyamoto, Akio; Kobayashi, Teruo; and Matsukawa, Hiroharu, 4,337,280, Cl. 427-150.000.

Koch, Friedhelm: *See*—
Koppern, Heinz; Bergendahl, Hans-Georg; Rieschel, Hartmut; and Koch, Friedhelm, 4,337,023, Cl. 425-237.000.

Kockums Industri AB: *See*—
Eklund, Urban, 4,336,731, Cl. 83-74.000.
Koda, N. John: *See*—
Alexander, David H.; Hershman, George H.; Jack, Michael D.; Koda, N. John; and Lloyd, Randahl B., 4,337,395, Cl. 250-332.000.
Kodaira, Kuniyasu: *See*—
Ohno, Mitio; Shimada, Yoichi; Furuhata, Hiroshi; Kanno, Ryoichi; Kodaira, Kuniyasu; and Matumoto, Hirozi, 4,336,808, Cl. 128-663.000.
Kodama, Hiroshi: *See*—
Sakurai, Mikio; Yoshimoto, Yuichiro; and Kodama, Hiroshi, 4,337,118, Cl. 376-210.000.
Koddebusch, Hubert: *See*—
Metzner, Wolfgang; Koddebusch, Hubert; and Poetter, Gerswid, deceased, 4,337,093, Cl. 106-18.330.
Koenig, Daniel R., to United States of America, Energy. Entirely passive heat pipe apparatus capable of operating against gravity. 4,336,837, Cl. 165-104.220.
Kolb, Walter, to Wolf-Gerate GmbH. Combination garden tool. 4,336,845, Cl. 172-349.000.
Kollar, John, to Celanese Corporation. Production of ethylene glycol by reaction of methanol, an organic peroxide and formaldehyde. 4,337,371, Cl. 568-852.000.
Komatsubara, Masahiro: *See*—
Kamimura, Teturo; Komatsubara, Masahiro; Ando, Shizuo; and Inanaga, Takugi, 4,337,490, Cl. 360-96.600.
Komatsubara, Shozi; and Katayama, Masanori, to Dainippon Screen Mfg. Co., Ltd. Apparatus for holding a copy in reproduction camera. 4,336,984, Cl. 352-75.000.
Kondo, Asaji: *See*—
Kitajima, Masao; Arai, Fuminori; and Kondo, Asaji, 4,337,222, Cl. 422-56.000.
Kondo, Norio: *See*—
Takagishi, Hisao; and Kondo, Norio, 4,336,835, Cl. 162-164.300.
Kopecko, William L.; Fuller, Robert L.; and Duchac, Joseph O. Fixture for resurfacing vehicle brake discs. 4,336,730, Cl. 82-4.00A.
Koppern, Heinz; Bergendahl, Hans-Georg; Rieschel, Hartmut; and Koch, Friedhelm, to Maschinenfabrik Koppern GmbH & Co. KG. Roller press for compacting and briquetting of bulk material. 4,337,023, Cl. 425-237.000.
Koritsu Machine Industries, Ltd.: *See*—
Kurihara, Tetsuo, 4,337,122, Cl. 202-248.000.
Korsell, Lars E. R., to Aktiebolaget Carl Munters. Device in an evaporative cooler. 4,337,216, Cl. 261-112.000.
Korzeczek, Karl-Ludwig: *See*—
Taubenmann, Peter; and Korzeczek, Karl-Ludwig, 4,337,026, Cl. 425-454.000.
Kosswig, Kurt: *See*—
Hentschel, Bernhard; Ziebarth, Jurgen; Coenen, Alfred; Kosswig, Kurt; and von Praun, Ferdinand, 4,337,234, Cl. 423-424.000.
Koulbanis, Constantin: *See*—
Ser, Jean-Claude; Zabotto, Arlette; Zaffran, Christian; and Koulbanis, Constantin, 4,337,241, Cl. 424-59.000.
Kouno, Kageaki: *See*—
Oki, Toshikazu; Yoshimoto, Akihiro; Kouno, Kageaki; Inui, Taiji; Takeuchi, Tomio; and Umezawa, Hamao, 4,337,312, Cl. 435-78.000.
Kozacka, Frederick J.; and Belcher, Richard A., to Gould Inc. Electric fuse having terminal caps and blades projecting through said caps. 4,337,452, Cl. 337-231.000.
Kramer, James C.: *See*—
Noller, Fred W.; and Kramer, James C., 4,336,860, Cl. 180-273.000.
Krauss-Maffei Aktiengesellschaft: *See*—
Taubenmann, Peter; and Korzeczek, Karl-Ludwig, 4,337,026, Cl. 425-454.000.
Kreft, Keith A., to Sun Electric Corporation. Automotive engine analyzer for indicating a no-connection condition of engine test leads. 4,337,515, Cl. 364-551.000.
Krevitz, Kenneth: *See*—
Pytlewski, Louis L.; Krevitz, Kenneth; and Smith, Arthur B., 4,337,368, Cl. 568-730.000.
Kroger, John E.: *See*—
Barnhart, David A.; Kroger, John E.; and Walters, David A., 4,336,749, Cl. 98-43.00R.
Krug, James E.; Magenau, Roger W.; and Hall, Jack P., to Divajex. Insulated container. 4,336,883, Cl. 206-545.000.
Krumlauf, Alfred C. Golf chip and putt practice device and game. 4,336,939, Cl. 273-185.00R.
Kubistant, Matt: *See*—
Maropis, Nicholas; and Kubistant, Matt, 4,337,385, Cl. 219-69.00V.
Kubo, Yoichiro; and Ohura, Kiyomori, to Nippon Zeon Co., Ltd. Process for hydrogenation of conjugated diene polymers. 4,337,329, Cl. 525-339.000.
Kucheck, Leo: *See*—
Crankshaw, Michael; and Kucheck, Leo, 4,337,108, Cl. 156-285.000.
Kuck, Mark A.; and Miller, Gary K., to Stauffer Chemical Company. Electrochemical synthesis of organophosphorus compounds from the element. 4,337,125, Cl. 204-59.00R.
Kugler, Edwin L.: *See*—
McCandlish, Larry E.; and Kugler, Edwin L., 4,337,232, Cl. 423-362.000.
Kuhnert, Werner: *See*—
Kahlert, Peter; Dittmann, Norbert; Fink, Heiner; Junker, Frank; Lehmann, Gunter; Schulz, Horst; Johne, Hans; Jentzsch, Arndt; and Kuhnert, Werner, 4,336,969, Cl. 308-61.000.
Kulprathipanja, Santi; and deRosset, Armand J., to UOP Inc. Organic bound adsorbents. 4,337,171, Cl. 252-430.000.
Kulyabko, Valery A.; Sinyavskaya, Vera M.; Sivkov, Alexandr A.; and Gavrilov, Evgeny N. Apparatus for fish protection. 4,337,008, Cl. 405-127.000.
Kunii, Daizo. Apparatus for thermally decomposing and gasifying combustible material in a single fluidized reactor. 4,337,066, Cl. 48-63.000.
Kureha Kagaku Kogyo Kabushiki Kaisha: *See*—
Yaguchi, Kunihide; Takaiwa, Masakazu; and Aoki, Minoru, 4,337,231, Cl. 423-243.000.
Yusa, Haruhiko; Iizuka, Yo; and Akutsu, Humio, 4,337,324, Cl. 525-72.000.
Kurihara, Tetsuo, to Koritsu Machine Industries, Ltd. Coke oven door. 4,337,122, Cl. 202-248.000.
Kurz, Craven H. Fixed lingual orthodontic appliance for the maxillary arch. 4,337,037, Cl. 433-8.000.
Kuwahara, Hiroshi: *See*—
Ohnishi, Makoto; Kuwahara, Hiroshi; and Maeda, Narimichi, 4,337,518, Cl. 364-724.000.
Kwak, Tae-Kyun: *See*—
Kim, Choong-Ki; Kwak, Tae-Kyun; and Choe, Seong-Hyeon, 4,337,475, Cl. 357-36.000.
Kwolek, William S., to Ervin Industries, Inc. Centrifugal blasting apparatus. 4,336,672, Cl. 51-432.000.
Label-Aire Inc.: *See*—
Crankshaw, Michael; and Kucheck, Leo, 4,337,108, Cl. 156-285.000.
Laboratoire Roger Bellon: *See*—
Techer, Henri; Monnier, Gilles; and Pesson, Marcel, 4,337,263, Cl. 424-273.00P.
Laboratoires Jacques Logeais: *See*—
Maillard, Jacques G.; Delaunay, Pierre P. A.; and Legeai, Jacky M. G., 4,337,343, Cl. 548-152.000.
Lacey, Edward H. Device for preparing and cleaning trench for an aquifer recharging system. 4,337,006, Cl. 405-176.000.
Lafarge Coppee: *See*—
Duplouy, Alain; and Le Bras, Bernard, 4,337,032, Cl. 432-106.000.
Laflamme, Marc: *See*—
Duchesne, Gaston; Laflamme, Marc; and Matte, Denis, 4,336,673, Cl. 52-27.000.
Laird, Gerald, to Ultradyne, Inc. Self-defense apparatus. 4,337,496, Cl. 361-232.000.
Lake & Elliot Incorporated: *See*—
Hall, Alan D., 4,336,919, Cl. 251-214.000.
Lakshmanan, Pallavoor R.: *See*—
Karim, Khalid A.; Lakshmanan, Pallavoor R.; and Rea, James H., 4,337,298, Cl. 428-461.000.
Lamont, James A.: *See*—
German, Paul M., Jr.; Lamont, James A.; and Gee, John C., 4,337,069, Cl. 55-229.000.
Lampert, Shlomo I. Measuring device. 4,337,391, Cl. 235-70.00A.
Lancaster, Patrick R.; and Lancaster, William G., to Lantech Inc. Film web drive stretch wrapping apparatus and process. 4,336,679, Cl. 53-399.000.
Lancaster, William G.: *See*—
Lancaster, Patrick R.; and Lancaster, William G., 4,336,679, Cl. 53-399.000.
Langs, James C. Heat recovery system. 4,336,905, Cl. 237-8.00R.
Lantech Inc.: *See*—
Lancaster, Patrick R.; and Lancaster, William G., 4,336,679, Cl. 53-399.000.
Lantz, Rose M. Bed sheet or the like securing means. 4,336,635, Cl. 24-72.500.
Larkins, Thomas H., Jr., to Eastman Kodak Company. Preparation of ethylidene diacetate. 4,337,351, Cl. 560-263.000.
Laroche, Paul G., to Glenhope Enterprises, Inc. Game including apertures simulating playing cards selected by a rolled ball. 4,336,938, Cl. 273-138.00R.
Lasker, Martin L., to Marley-Wylain Company, The. Lighting fixture with directional distribution. 4,337,507, Cl. 362-282.000.
Latucca, Vincent; and Bronsther, Burton. Adjustable surgical drape. 4,336,797, Cl. 128-132.00D.
LaTulip, Arthur C.: *See*—
Brenner, Kurt H., Jr.; LaTulip, Arthur C.; and Oetken, James E., 4,337,304, Cl. 430-24.000.
Lau, Keyser K.: *See*—
Lauer, James L.; King, Vincent W.; and Lau, Keyser K., 4,337,396, Cl. 250-340.000.
Lauer, James L.; King, Vincent W.; and Lau, Keyser K., to Suncor Inc. Method for bitumen analysis and apparatus therefor. 4,337,396, Cl. 250-340.000.
Laul, Virgil R.: *See*—
Van Riper, Wilbur E.; and Laul, Virgil R., 4,337,377, Cl. 179-2.00R.
Laurent, Jean; Monnet, Bernard; and Pertuis, Philippe, to Pont-a-Mousson S.A. Adaptable injection molding installation mounting arrangement. 4,337,022, Cl. 425-192.00R.
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Comte, Georges N.; Appriou, Andre; and Couturier, Jean, 4,337,019, Cl. 425-116.000.

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Schilp, Ulrich, 4,337,163, Cl. 252-96.000.

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Schaller, Maurice, 4,336,834, Cl. 160-168.00A.

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Guggenbuhl, Walter; and Halder, Mathis, 4,337,438, Cl. 330-10.000.

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Pschunder, Willi; and Steinmetz, Gerhard, 4,336,648, Cl. 29-572.000.

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Lin, Yih-Chou. Bathing brush. 4,336,623, Cl. 15-222.000.

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Johnson, Roy A.; Lincoln, Frank H.; and Pike, John E., 4,337,204, Cl. 549-465.000.

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Rohde, Wilhelm, 4,337,070, Cl. 62-18.000.
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Ando, Hideo; Hayashi, Akira; Ohkouchi, Haruo; and Kitano, Kyozo, 4,337,165, Cl. 252-105.000.

Lipp, Herbert, to Sybron Corporation. Expandable legrest for dental chairs. 4,336,965, Cl. 297-435.000.

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Alexander, David H.; Hershman, George H.; Jack, Michael D.; Koda, N. John; and Lloyd, Randahl B., 4,337,395, Cl. 250-332.000.

Lo, Christopher C. C.: *See—*
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Loeb, Warner, to Identifax Nationwide Registry. Property identification system. 4,336,754, Cl. 101-127.000.

Logsdon, John E.; and Kiff, Ben W., to Union Carbide Corporation. Catalytic liquid-phase oxidation of butane. 4,337,356, Cl. 562-549.000.

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van Staden, Renier J., 4,336,931, Cl. 272-1.00B.

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Dinkel, Rolf, 4,337,342, Cl. 546-251.000.

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Ser, Jean-Claude; Zabotto, Arlette; Zaffran, Christian; and Koulbanis, Constantin, 4,337,241, Cl. 424-59.000.

Love, Gary N.: *See—*
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Low, Leonard J. Method and apparatus for installing steering axle pivot pins. 4,336,953, Cl. 280-95.00R.

Loyzim, Robert J., to General Electric Company. Braking system for a medical diagnostic device. 4,336,858, Cl. 180-179.000.

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Prokop, James A., 4,336,720, Cl. 73-862.530.

Lunau, John A. Electrically controlled in-line dispensing faucet. 4,336,896, Cl. 222-504.000.

Lund, Richard A., to MTS Systems Corporation. Servovalve flow linearization circuit. 4,336,745, Cl. 91-35.000.

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Lynch, John F., to Frebar Holding AG. Aeration apparatus and method. 4,337,152, Cl. 210-197.000.

Lynn, Robert W., to Becton, Dickinson and Company. Method for manufacturing a roller bottle. 4,337,104, Cl. 156-69.000.

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Lythgoe, Alan L.: *See—*
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M-S Surgical Mfg. Co., Ltd.: *See—*
Saito, Tsuyoshi; and Ogiwara, Masaru, 4,337,038, Cl. 433-32.000.

Machida Endoscope Co., Ltd.: *See—*
Chikama, Toshio, 4,336,794, Cl. 128-4.000.

Mackay, Duncan R.; Arnold, Arthur K.; and Holm, Donald C., to Autotron Equipment Corporation. Drive belt tensioning apparatus. 4,337,055, Cl. 474-111.000.

Macksoud, Albert A. Rocking arm saw. 4,336,733, Cl. 83-477.200.

MacLean, John P.; Cantwell, J. Edward; Brown, John D.; and Hoy, Harold D., to Texaco Inc. Methods for removing entrained solids from gases. 4,337,068, Cl. 55-1.000.

Maeda, Narimichi: *See—*
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Maehara, Osamu; and Harada, Tsutomu, to Ono Sokki Co., Ltd. Gear mesh testing instruments. 4,336,711, Cl. 73-162.000.

Maezumi, Juichi, to Tokyo Shibaura Denki Kabushiki Kaisha. Read control system for a control storage device. 4,337,510, Cl. 364-200.000.

Magenau, Roger W.: *See—*
Krug, James E.; Magenau, Roger W.; and Hall, Jack P., 4,336,883, Cl. 206-545.000.

Magnan, Alfredo J., to Suave Shoe Corporation. Automatic sewing apparatus. 4,336,761, Cl. 112-121.120.

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Duff, James A.; and Boisvert, Donald R., 4,336,631, Cl. 16-126.000.
Maher, James C.; and Carlotta, Michael, to Xerox Corporation. Roll fusing apparatus for electrophotography and release agent management system therefor. 4,336,766, Cl. 118-60.000.
Mahler, Friedrich; and Stauffer, Adolf, to Davy McKee Aktiengesellschaft. Apparatus for conducting the catalytic oxidation of gaseous sulfur compounds to sulfur trioxide. 4,337,224, Cl. 422-197.000.
Maillard, Jacques G.; Delaunay, Pierre P. A.; and Legeai, Jacky M. G., to Laboratoires Jacques Logeais. 4,5 or 6-Alkylaminoalkyl-2-alkyl-4,5,6,7-tetrahydro benzo[d]thiazoles. 4,337,343, Cl. 548-152.000.
Mainardi, Giuliano: *See—*
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Maiocco, Guiseppe, to ARMAN S.p.A. Wiper blade. 4,336,625, Cl. 15-250.420.
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Manara, Giovanni: *See—*
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Mann, Horace C., Jr.; and Meline, Robert S., to Tennessee Valley Authority. Low polyphosphate suspension fertilizers from wet-process acid. 4,337,079, Cl. 71-34.000.
Mannon, Walter L.; and Cochran, Cary L., to Victor United, Inc. Attachment member for securing the ends of cables in a compound bow. 4,336,786, Cl. 124-23.00R.
Manville Service Corporation: *See—*
Bradley, Timothy G., 4,337,157, Cl. 210-691.000.
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Markus, Henry Z.; and McAleer, William J., to Merck & Co., Inc. Vaccine stabilizer containing L-glutamic acid and L-arginine. 4,337,242, Cl. 424-89.000.
Marley-Wylain Company, The: *See—*
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Martin, Raymond H.; Garganese, Ugo S.; and Griffin, John R. Plasterless articulator. 4,337,039, Cl. 433-60.000.
Martin, Stanley I.; and Martin, Edward J., to Axis Products Limited. Fluid exchanger. 4,336,748, Cl. 98-33.00A.
Martinek, Harold H.: *See—*
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Martinek, Thomas W.: *See—*
Wilson, Willard T.; Martinek, Harold H.; Martinek, Thomas W.; and Story, Alfred D., 4,336,632, Cl. 17-1.00R.
Martucci Frank C. Dripless ceiling paint roller and paint metering pan. 4,337,002, Cl. 401-15.000.
Marynowski, Chester W.; and Geigel, Maria A., to Clorox Company, The. Controlled crystallization diperoxyacid process. 4,337,213, Cl. 260-502.00R.
Maschinenbau Oppenweiler Binder GmbH & Co.: *See—*
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McArdle, Beryl L.; and Tapernoux, Pierre J., to General Dynamics Corporation, Electronics Division. Blanking wave generator for binary code synchronizing system. 4,337,436, Cl. 328-157.000.
McCandlish, Larry E.; and Kugler, Edwin L., to Exxon Research & Engineering Co. Ammonia synthesis process using molybdenum oxycarbonitride catalyst. 4,337,232, Cl. 423-362.000.
McDonald, Hector O.; and George, Lawrence C., to United States of America, Interior. Recovery of chromium from waste solutions. 4,337,227, Cl. 423-55.000.
McDowell, Jerry T., to Ball Corporation. Apparatus for orienting and sizing battery grids. 4,336,704, Cl. 72-324.000.
McElroy, David J., to Texas Instruments Incorporated. Method of making implant programmable N-channel read only memory. 4,336,647, Cl. 29-571.000.
McElroy, Jerry W.; and Urban, Donald C., to Emerson Electric Co. Pilot burner assembly. 4,337,029, Cl. 431-264.000.
McGeeney, Kevin F., to Pharmacia Diagnostics AB. Method of determining the concentration of pancreatic and salivary α-amylase in body fluids. 4,337,309, Cl. 435-22.000.
McGraw-Edison Company: *See—*
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McGrew, Bernard L., to FMC Corporation. Ring supported truck crane and method of setting up. 4,336,889, Cl. 212-178.000.
McNeil, Brian A., to Air Products and Chemicals, Inc. Method and apparatus for manufacturing ammonia synthesis gas from a stream of gas rich in hydrogen and a stream of nitrogen. 4,337,072, Cl. 62-42.000.
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Mechel, John R.; and Brosch, Eric J., to Manville Service Corporation. Twin center cooling fin for tip type bushing. 4,337,075, Cl. 65-12.000.
Medlin, Richard C. Method of installing bulletproof windows in an armored automobile. 4,336,644, Cl. 29-401.100.
Medrano, Walter A. Shoe insert. 4,336,661, Cl. 36-44.000.
Meek, Robert P., to Ecomar, Inc. Retrieval of articles from beneath the surface of a body of water. 4,336,709, Cl. 73-61.200.
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Melissa, Raymond F.; Grumnett, Lorne H.; and Fischer, Joseph J., to Trilog, Inc. Apparatus for producing a multiple color hard copy image. 4,336,751, Cl. 101-93.040.

Melmon, Kenneth L.: *See—*
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Rooney, Clarence S.; Williams, Haydn W. R.; Cragoe, Edward J., Jr.; and Patchett, Arthur A., 4,337,258, Cl. 424-263.000.
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Metzner, Wolfgang; Koddebusch, Hubert; and Poetter, Gerswid, deceased (by Seeholzer, Ursula, heiress), to Deutsche Solvay Werke GmbH. Wood preserving composition and method of using same. 4,337,093, Cl. 106-18.330.

Meyer, Arthur S., to United States of America, Air Force. Compensated temperature sensing device. 4,336,713, Cl. 374-197.000.

Meyer, Lawrence L., to Eaton Corporation. Valve selector. 4,336,775, Cl. 123-198.00F.

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Mick, Peter; and Beck, Donald. Motion and intrusion detecting system. 4,337,481, Cl. 358-105.000.

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Mietens, Gerhard: *See—*
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Miles Laboratories, Inc.: *See—*
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Miller, Arthur. Hardness tester. 4,336,710, Cl. 73-79.000.

Miller, Gary K.: *See—*
Kuck, Mark A.; and Miller, Gary K., 4,337,125, Cl. 204-59.00R.

Miller, Jan D.: *See—*
Hanson, Francis V.; Miller, Jan D.; and Oblad, Alex G., 4,337,143, Cl. 208-11.00R.

Miller, Samuel A.: *See—*
Gardner, Kenneth L.; Zimmer, William E.; and Miller, Samuel A., 4,337,031, Cl. 432-98.000.

Minami, Nobuyoshi: *See—*
Suzuki, Yasushi; Tsukamoto, Kunio; Minami, Nobuyoshi; Hasegawa, Yukio; Satoh, Michitaka; Yamamoto, Norio; Miyasaka, Katsuhiko; Mikami, Takashi; and Funakoshi, Satoshi, 4,337,256, Cl. 424-258.000.

Minatono, Hisae: *See—*
Esashi, Kiyoyuki; and Minatono, Hisae, 4,337,087, Cl. 75-124.000.

Minnesota Mining and Manufacturing Company: *See—*
Beretta, Paolo; Leichter, Louis M.; and Stofko, John J., Jr., 4,337,305, Cl. 430-82.000.
Brookhart, Marshall R.; Hodge, Fredrick J.; and Worden, Thomas J., 4,337,492, Cl. 360-109.000.
Eshleman, Ronald J., 4,337,107, Cl. 156-249.000.
Melancon, Kurt C.; and Palensky, Frederick J., 4,337,332, Cl. 528-15.000.
Sahyun, Melville R. V.; Chen, Tsung-I; King, Timothy W.; Mikelsons, Valdis; and Mitra, Smarajit, 4,337,303, Cl. 430-11.000.

Minnetti, Federico, to Officine Minnetti di Ornella Reveggi & C. S.A.S. Apparatus for the transfer of hanks. 4,336,875, Cl. 198-486.000.

Mishima, Toshio, to Kabushiki Kaisha Kawai Gakki Seisakusho. Electronic musical instrument. 4,336,736, Cl. 84-1.260.

Mitra, Smarajit: *See—*
Sahyun, Melville R. V.; Chen, Tsung-I; King, Timothy W.; Mikelsons, Valdis; and Mitra, Smarajit, 4,337,303, Cl. 430-11.000.

Mitsubishi Chemical Industries, Ltd.: *See—*
Otake, Masayuki, 4,337,173, Cl. 252-435.000.

Mitsubishi Denki Kabushiki Kaisha: *See—*
Endo, Norio; and Nakagami, Tatsuro, 4,336,782, Cl. 123-494.000.
Yukimoto, Yoshinori, 4,337,474, Cl. 357-22.000.

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Endo, Norio; and Nakagami, Tatsuro, 4,336,782, Cl. 123-494.000.

Mitsubishi Kinzoku Kabushiki Kaisha: *See—*
Itaba, Takeshi; and Matsumoto, Shotaro, 4,337,300, Cl. 428-627 000.

Mitsubishi Paper Mills, Ltd.: *See—*
Shimazaki, Tetsuro, 4,337,169, Cl. 252-316.000.

Mitsubishi Rayon Co., Ltd.: *See—*
Doi, Shunichi; and Kamogawa, Masatake, 4,337,215, Cl. 260-513.00N.

Mitsui Toatsu Chemicals Inc.: *See—*
Shimizu, Yoshiro; Itakura, Toshio; Iwasa, Mitsuhiro; and Hanauye, Kunio, 4,337,334, Cl. 528-137.000.

Miyake, Yasuo: *See—*
Iwagiri, Susumu; Hattori, Teiichi; Nasu, Teruyoshi; and Miyake, Yasuo, 4,337,246, Cl. 424-174.000.

Miyamoto, Akio; Kobayashi, Teruo; and Matsukawa, Hiroharu, to Fuji Photo Film Co., Ltd. Desensitizer composition. 4,337,280, Cl. 427-150.000.

Miyasaka, Katsuhiko: *See—*
Suzuki, Yasushi; Tsukamoto, Kunio; Minami, Nobuyoshi; Hasegawa, Yukio; Satoh, Michitaka; Yamamoto, Norio; Miyasaka, Katsuhiko; Mikami, Takashi; and Funakoshi, Satoshi, 4,337,256, Cl. 424-258.000.

Miyazako, Takushi: *See—*
Hiratsuka, Nobuo; Mihara, Yuji; Masuda, Nobuhito; and Miyazako, Takushi, 4,337,065, Cl. 23-230.00B.

Miyazako, Takushi, both of: *See—*
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Mize, Pete. Variable speed transmission. 4,336,724, Cl. 74-750.00R.

Mizuno, Akinori, to Ricoh Co., Ltd. Method and device for controlling concentration of ink for ink-jet printer. 4,337,468, Cl. 346-1.100.

Mizutani, Hitoshi: *See—*
Tsukiyama, Yoshifumi; Hatanaka, Yasunori; Ogawa, Akiyoshi; and Mizutani, Hitoshi, 4,336,696, Cl. 464-111.000.

Mizutani, Masato: *See—*
Hashimoto, Shunichi; Oshio, Hiromichi; Mizutani, Masato; Sanemitsu, Yuzuru; Katoh, Haruhiko; and Sumida, Seizo, 4,337,082, Cl. 71-93.000.

Moberly, Frank. Earth scraper assembly. 4,336,663, Cl. 37-129.000.

Mod, William A.: *See—*
Ezzell, Bobby R.; Carl, William P.; and Mod, William A., 4,337,211, Cl. 260-456.00F.

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Van Megen, Everardus A.; Simons, Carel A.; and Moen, Eduard W., 4,337,535, Cl. 369-121.000.

Moffatt, David A., to Moffatt Products, Inc. High wattage lamp fixture. 4,337,508, Cl. 362-294.000.

Moffatt Products, Inc.: *See—*
Moffatt, David A., 4,337,508, Cl. 362-294.000.

Mohlmann, Hans H., to Shortland Engineering International Anstalt. Cap or closure for tubes and bottles. 4,336,890, Cl. 215-272.000.

Monaghan, Kevin J.; and Schwickert, Russell C., to Bunker Ramo Corporation. Crimped connector assembly for fiber optic cables. 4,336,977, Cl. 350-96.200.

Moncada, Salvador E., to Burroughs Wellcome Co. Pharmaceutical compositions. 4,337,254, Cl. 424-251.000.

Monitronik Ltee.: *See—*
Duchesne, Gaston; Laflamme, Marc; and Matte, Denis, 4,336,673, Cl. 52-27.000.

Monnet, Bernard: *See—*
Laurent, Jean; Monnet, Bernard; and Pertuis, Philippe, 4,337,022, Cl. 425-192.00R.

Monnier, Gilles: *See—*
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Monsanto Company: *See—*
Mount, Ramon A.; and Raffelson, Harold, 4,337,174, Cl. 252-437.000.

Monseol Limited: *See—*
Ceolotto, Egidio, 4,336,695, Cl. 62-504.000.

Montieth, Royel F. Injection mold valve. 4,337,027, Cl. 425-562.000.

Moore, Robert: *See—*
Andrews, E. Trent; and Moore, Robert, 4,336,796, Cl. 128-87.00R.

Moreau, Claude R. M., to AMTOY, Inc. Convertible stuffed toy. 4,336,665, Cl. 46-153.000.

Morgan, David F., to Eaton Corporation. Load sensing controller. 4,336,687, Cl. 60-384.000.

Morgan, John W., II; and Leumann, Hans E., to Bloom Engineering Company, Inc. Protective refractory member locking device. 4,337,034, Cl. 432-234.000.

Mori, Masaaki, to Ricoh Co., Ltd. Simultaneous multi-beam optical modulation system. 4,336,981, Cl. 350-358.000.

Morinaga, Misao, to Otsuka Chemical Co., Ltd. Expandable vinyl chloride resin composition. 4,337,320, Cl. 521-137.000.

Morioka, Akitoshi: *See—*
Iwata, Hiroshi; Yamaoka, Tetsuo; and Morioka, Akitoshi, 4,336,985, Cl. 354-145.000.

Morith, Franklin J. Self retracting piston applicable for disk brake assemblies. 4,336,746, Cl. 92-130.00B.

Moritz, Joseph J.: *See—*
Wisnouskas, Joseph S.; and Moritz, Joseph J., 4,337,235, Cl. 423-468.000.

Morokawa, Shigeru, to Citizen Watch Company Limited. Pace timing device. 4,337,529, Cl. 368-10.000.

Moses, Edward L., Jr. Non-magnetic stabilizer. 4,337,088, Cl. 75-128.00A.
Moskin, Jeffrey M.: *See—*
Smith, Jay, III; and Moskin, Jeffrey M., 4,337,460, Cl. 340-384.00E.
Moss Rosenberg Verft A/S: *See—*
Tonnessen, Arne, 4,336,764, Cl. 114-74.00A.
Mostek Corporation: *See—*
Davis, Harold L., 4,337,378, Cl. 179-18.0FA.
Parkinson, Ward D., 4,337,524, Cl. 365-229.000.
Motomura, Toshiharu: *See—*
Noda, Kanji; Nakagawa, Akira; Motomura, Toshiharu; Tsuji, Masayoshi; Amano, Hidetoshi; and Ide, Hiroyuki, 4,337,270, Cl. 424-310.000.
Motosugi, Katsuhiko: *See—*
Sumiyoshi, Masaharu; Sekiya, Setsuro; Motosugi, Katsuhiko; Takahashi, Hiroshi; and Toyoda, Shuhei, 4,336,776, Cl. 123-306.000.
Mount, Ramon A.; and Raffelson, Harold, to Monsanto Company. Method for preparing a catalyst and intermediate formed thereby. 4,337,174, Cl. 252-437.000.
Mroczkowski, Zbigniew. Tool. 4,336,831, Cl. 144-2.00R.
MTS Systems Corporation: *See—*
Lund, Richard A., 4,336,745, Cl. 91-35.000.
Mukaiyama, Teruaki; Sakito, Yoji; and Asami, Masatoshi, to Sumitomo Chemical Company, Limited. α-Hydroxyaldehyde and a process for preparing the same. 4,337,346, Cl. 548-324.000.
Mulhollam, Gail R.: *See—*
Clinard, Glenn G.; Mulhollam, Gail R.; and Volk, Frank J., 4,337,528, Cl. 367-136.000.
Muller, Rolf: *See—*
Cap, Heinrich; von der Heide, Johann; and Muller, Rolf, 4,337,424, Cl. 318-328.000.
Muller, Walter: *See—*
Horn, Kurt; Muller, Walter; and Schneider, Adolf, 4,336,743, Cl. 89-37.00B.
Mullins, Keith M.: *See—*
Cammack, Michael A.; Elkins, Christopher W.; Hickman, Clarence J.; and Mullins, Keith M., 4,337,040, Cl. 433-80.000.
Mund, Konrad; Richter, Gerhard; and Weidlich, Erhard, to Siemens Aktiengesellschaft. Electrochemical capacitor. 4,337,501, Cl. 361-433.000.
Mundell, Donald D.; and Tieman, Lloyd E., to Flex-O-Lators, Inc. Connector terminus for wire members. 4,337,004, Cl. 403-209.000.
Munenobu, Hideaki: *See—*
Fukushima, Susumu; Munenobu, Hideaki; and Yamade, Kazuhiro, 4,337,315, Cl. 435-313.000.
Munoz, Joseph P., to Westinghouse Electric Corp. Digital phase sequence detector. 4,337,435, Cl. 328-133.000.
Murakawa, Kiyoshi: *See—*
Arita, Kishio; Murakawa, Kiyoshi; and Takahashi, Toshio, 4,337,089, Cl. 420-472.000.
Murarka, Shyam P.: *See—*
Fraser, David B.; and Murarka, Shyam P., 4,337,476, Cl. 357-67.000.
Murphy, Richard D.; and Clelford, Douglas H., to United Technologies Corporation. Sensor fault detection by activity monitoring. 4,337,516, Cl. 364-551.000.
Murray, Myles N., to Industrial Electronic Rubber Company. Valve element with molded resilient tip and method of making same. 4,336,920, Cl. 251-357.000.
Muschelknautz, Edgar; and Rink, Norbert, to Bayer Aktiengesellschaft. Process for production of mineral wool fibers. 4,337,074, Cl. 65-5.000.
N P S K "Mineralagro": *See—*
Petrov, Georgi S.; Petkov, Ivan A.; Etropolski, Hristo I.; Dimitrov, Dimiter N.; Popov, Nikolay N.; and Uzunov, Atanas I., 4,337,078, Cl. 71-24.000.
Nagabhushan, Tattanahalli L.; Turner, William N.; and Cooper, Alan, to Schering Corporation. Transition metal salt complexes of polyamino organic compounds. 4,337,335, Cl. 536-13.600.
Nagashima, Kazuyoshi; and Furuya, Nobuyuki, to Fuji Sangyo Kabushiki Kaisha. Fundamental electrical element array. 4,337,453, Cl. 338-320.000.
Nagel, Dieter H.: *See—*
Pagels, Louis T.; and Nagel, Dieter H., 4,337,025, Cl. 425-392.000.
Naka, Junichi: *See—*
Omi, Yasuo; Wada, Takanori; Sano, Hitoshi; Sato, Shigekatsu; Ido, Kazuo; Taneda, Kozo; and Naka, Junichi, 4,337,021, Cl. 425-142.000.
Nakagami, Tatsuro: *See—*
Endo, Norio; and Nakagami, Tatsuro, 4,336,782, Cl. 123-494.000.
Nakagawa, Akira: *See—*
Noda, Kanji; Nakagawa, Akira; Motomura, Toshiharu; Tsuji, Masayoshi; Amano, Hidetoshi; and Ide, Hiroyuki, 4,337,270, Cl. 424-310.000.
Nakai, Kiyoshi: *See—*
Kanagawa, Shuichi; Nakao, Shinji; Nakai, Kiyoshi; Kamio, Kunimasa; Matsushima, Shunsuke; Hata, Kazuhiko; and Mashita, Kentaro, 4,337,367, Cl. 568-720.000.
Nakai, Syunzi: *See—*
Shimizu, Youiti; Tsumura, Takeo; Matsumoto, Tadashi; and Nakai, Syunzi, 4,337,472, Cl. 346-155.000.
Nakajima, Kazuhisa; Gohgi, Kazuaki; and Yamamoto, Toshio, to Nippon Gohsei Kagaku Kogyo Kabushiki Kaisha. Process for preparing 4-hydroxyphenylacetic acid. 4,337,355, Cl. 562-478.000.
Nakamura, Hachiro; and Nakazawa, Norio, to Toppan Printing Company, Limited. Method for storing produce and container and freshness keeping agent therefore. 4,337,276, Cl. 426-124.000.
Nakamura, Hiroyuki; and Nakaya, Shuniti, to Tokyo Shibaura Denki Kabushiki Kaisha. Refrigerator. 4,337,399, Cl. 290-1.00R.
Nakamura, Michiharu: *See—*
Umeda, Jun-ichi; Shimada, Toshikazu; Nakamura, Michiharu; Katayama, Yoshifumi; Kajimura, Takashi; and Yamashita, Shigeo, 4,337,443, Cl. 372-49.000.
Nakamura, Yoshio: *See—*
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Nakao, Shinji: *See—*
Kanagawa, Shuichi; Nakao, Shinji; Nakai, Kiyoshi; Kamio, Kunimasa; Matsushima, Shunsuke; Hata, Kazuhiko; and Mashita, Kentaro, 4,337,367, Cl. 568-720.000.
Nakaya, Shuniti: *See—*
Nakamura, Hiroyuki; and Nakaya, Shuniti, 4,337,399, Cl. 290-1.00R.
Nakaya, Takao, to Nippon Gakki Seizo Kabushiki Kaisha. Planar electrodynamic electroacoustic transducer. 4,337,379, Cl. 179-115.5PV.
Nakazawa, Norio: *See—*
Nakamura, Hachiro; and Nakazawa, Norio, 4,337,276, Cl. 426-124.000.
Nakazono, Sadatosi: *See—*
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Nanne, Johannes M.: *See—*
Boersma, Michael A. M.; Nanne, Johannes M.; and Post, Martin F. M., 4,337,176, Cl. 252-459.000.
Narita, Kinjo. Process of preparing an ornament for tombstones or the like. 4,337,109, Cl. 156-293.000.
Nasu, Teruyoshi: *See—*
Iwagiri, Susumu; Hattori, Teiichi; Nasu, Teruyoshi; and Miyake, Yasuo, 4,337,246, Cl. 424-174.000.
National Element, Inc.: *See—*
Best, Lorne A., 4,337,390, Cl. 219-532.000.
National Research Development Corporation: *See—*
Crisp, Stephen; and Wilson, Alan D., 4,337,186, Cl. 525-362.000.
Naumann, Klaus, to Bayer Aktiengesellschaft. Separation of enantiomers of chiral carboxylic acids. 4,337,352, Cl. 562-401.000.
Neal, Albert D. Thermostat alterable by remote control. 4,336,902, Cl. 236-46.00R.
Nederlandse Omroep Stichting: *See—*
de Korte, Jacob, 4,337,440, Cl. 330-129.000.
Needham, Donald G., to Phillips Petroleum Company. Poly (arylene sulfide) composition suitable for use in semi-conductor encapsulation. 4,337,182, Cl. 524-609.000.
Nelson, Robert T. Surface cleaning apparatus. 4,336,671, Cl. 51-424.000.
Netlon Limited: *See—*
Mercer, Frank B., 4,336,638, Cl. 26-99.000.
Neubauer, Rudolf, to Hoechst Aktiengesellschaft. Light-sensitive diazo composition and material with branched polyurethane resin. 4,337,307, Cl. 430-157.000.
New England Nuclear Corporation: *See—*
Saklad, Eugene L., 4,337,240, Cl. 424-1.000.
Newberry, Richard D., to Eltra Corporation. Magneto ignition with field-responsive biasing. 4,336,785, Cl. 123-605.000.
NGK Insulators, Ltd.: *See—*
Satomi, Seigo, 4,336,863, Cl. 181-224.000.
Nichols, Steven B. Derotation brace. 4,336,795, Cl. 128-80.00A.
Nickel, Horst: *See—*
Vater, Hans-Joachim; Nickel, Horst; and Henk, Hermann, 4,337,195, Cl. 260-146.00T.
Nickel, Walter; and Tarczy-Hornoch, Zoltan, to Systron Donner Corporation. Method of automatically calibrating a microprocessor controlled digital multimeter. 4,337,517, Cl. 364-571.000.
Nihei, Ryo: *See—*
Inagaki, Shigemi; and Nihei, Ryo, 4,336,926, Cl. 269-34.000.
Nihon Telecommunication Engineering Corporation: *See—*
Arita, Kishio; Murakawa, Kiyoshi; and Takahashi, Toshio, 4,337,089, Cl. 420-472.000.
Ninagawa, Sadami: *See—*
Kaneko, Takayuki; and Ninagawa, Sadami, 4,336,770, Cl. 122-266.000.
Nippon Bell Parts Co., Ltd.: *See—*
Arita, Kishio; Murakawa, Kiyoshi; and Takahashi, Toshio, 4,337,089, Cl. 420-472.000.
Nippon Electric Co., Ltd.: *See—*
Akatsuka, Yasuo, 4,337,525, Cl. 365-233.000.
Nippon Gakki Seizo Kabushiki Kaisha: *See—*
Amano, Takehisa; Hamada, Seiya; Isii, Sigeki; and Takeda, Toshio, 4,336,735, Cl. 84-1.170.
Nakaya, Takao, 4,337,379, Cl. 179-115.5PV.
Nippon Gohsei Kagaku Kogyo Kabushiki Kaisha: *See—*
Nakajima, Kazuhisa; Gohgi, Kazuaki; and Yamamoto, Toshio, 4,337,355, Cl. 562-478.000.
Nippon Oil Company, Ltd.: *See—*
Imai, Hirosuke; Yamanashi, Teruaki; and Itoh, Hiroyuki, 4,337,062, Cl. 8-557.000.
Nippon Paint Co., Ltd.: *See—*
Arimatsu, Seiji, 4,337,220, Cl. 264-25.000.
Nippon Shokubai Kagaku Kogyo Co., Ltd.: *See—*
Fukuchi, Shuzo; Hayashi, Tetsuzo; Kobayashi, Hiroya; and Oshiumi, Ryoichi, 4,337,154, Cl. 210-490.000.

Nippon Soken, Inc.: *See*—
Yamaguchi, Hiroaki; Hattori, Tadashi; and Ootsuka, Yoshinori, 4,336,707, Cl. 73-35.000.
Nippon Telegraph and Telephone Public Corporation: *See*—
Arita, Kishio; Murakawa, Kiyoshi; and Takahashi, Toshio, 4,337,089, Cl. 420-472.000.
Takano, Rikuo; and Sumitomo, Yuji, 4,337,469, Cl. 346-75.000.
Nippon Zeon Co., Ltd.: *See*—
Kubo, Yoichiro; and Ohura, Kiyomori, 4,337,329, Cl. 525-339.000.
Nishihara, Tadashi, to Yokogawa Electric Works, Ltd. Pneumatic converter. 4,336,819, Cl. 137-85.000.
Nishimoto, Tetsunori. Multiple/divide unit. 4,337,519, Cl. 364-736.000.
Nishizawa, Jun-ichi, to Handotai Kenkyu Shinkokai. Junction field effect transistor having unsaturated drain current characteristic with lightly doped drain region. 4,337,473, Cl. 357-22.000.
Nissan Motor Co., Ltd.: *See*—
Sone, Masazumi; and Hirota, Yukitsugu, 4,337,408, Cl. 313-130.000.
Yanagihara, Masanobu; Kaneuchi, Yoichiro; and Kobayashi, Shoji, 4,336,777, Cl. 123-306.000.
Nissen, Michael D.: *See*—
Stone, Albert J.; and Nissen, Michael D., 4,336,802, Cl. 128-272.000.
Nitachi, Ltd.: *See*—
Ohnishi, Makoto; Kuwahara, Hiroshi; and Maeda, Narimichi, 4,337,518, Cl. 364-724.000.
Nitto Chemical Industry Co., Ltd.: *See*—
Doi, Shunichi; and Kamogawa, Masatake, 4,337,215, Cl. 260-513.00N.
Nix, Edwin L.; and Davenport, Bobby E. Truck bed liner. 4,336,963, Cl. 296-39.00R.
Noda, Kanji; Nakagawa, Akira; Motomura, Toshiharu; Tsuji, Masayoshi; Amano, Hidetoshi; and Ide, Hiroyuki, to Hisamitsu Pharmaceutical Co., Inc. Novel anthranilic acid derivatives. 4,337,270, Cl. 424-310.000.
Noda, Teruyoshi; Ichikawa, Iwao; and Takahashi, Toshio, to Sony Corporation. Apparatus for transferring parts or the like. 4,336,872, Cl. 193-2.00R.
Noller, Fred W.; and Kramer, James C., to Prime-Mover Co., The. Material handling vehicle having improved deadman control. 4,336,860, Cl. 180-273.000.
Nonnenmann, Wolfgang: *See*—
Schneider, Erich; Fleischer, Helmut; Nonnenmann, Wolfgang; and Gerum, Benno, 4,337,511, Cl. 364-426.000.
Nordischer Maschinenbau Rud. GmbH Co. KG: *See*—
Braeger, Horst, 4,336,634, Cl. 17-57.000.
Nordson Corporation: *See*—
Boone, Jacob J., 4,337,281, Cl. 427-236.000.
Grevich, John J., 4,336,680, Cl. 53-389.000.
Norman, Richard O., to Elfab Corporation. Continuous truck mounted printed circuit board plating system. 4,337,134, Cl. 204-198.000.
North American Philips Consumer Electronics Corp.: *See*—
Brenner, Kurt H., Jr.; LaTulip, Arthur C.; and Oetken, James E., 4,337,304, Cl. 430-24.000.
Northern Telecom Limited: *See*—
Willemsen, Herman W., 4,337,531, Cl. 369-45.000.
Norwid, Alan: *See*—
Scardera, Michael; and Norwid, Alan, 4,337,168, Cl. 252-312.000.
Notari, Bruno: *See*—
Fattore, Vittorio; Manara, Giovanni; and Notari, Bruno, 4,337,366, Cl. 568-698.000.
Nowakowski, Victor A., to Mattel, Inc. Motion sensor switch and circuit for use therewith. 4,337,402, Cl. 307-121.000.
Nozaki, Mineo: *See*—
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Oana, Mateiu J.: *See*—
Singer, Carl M.; Oana, Mateiu J.; and Turko, John D., 4,337,018, Cl. 418-132.000.
Oberth, Adolf E.; and Price, Howard A., to United States of America, Air Force. High energy solid propellant composition. 4,337,102, Cl. 149-19.300.
Oblad, Alex G.: *See*—
Hanson, Francis V.; Miller, Jan D.; and Oblad, Alex G., 4,337,143, Cl. 208-11.00R.
O'Bryan, Henry M., Jr.; and Thomson, John, Jr., to Bell Telephone Laboratories, Incorporated. Apparatus for processing microwave electrical energy. 4,337,446, Cl. 333-238.000.
Occidental Oil Shale, Inc.: *See*—
Ricketts, Thomas E., 4,336,966, Cl. 299-2.000.
Occidental Research Corporation: *See*—
Dines, Martin B., 4,337,225, Cl. 423-10.000.
ODECO Engineers, Inc.: *See*—
Petty, Terry D., 4,336,843, Cl. 166-362.000.
Oeschger, Max P.; Hooke, Anne M.; and Bellanti, Joseph A., to Research Corporation. Genetically attenuated bacterial vaccines with multiple mutations of the same phenotype. 4,337,314, Cl. 435-253.000.
Oetken, James E.: *See*—
Brenner, Kurt H., Jr.; LaTulip, Arthur C.; and Oetken, James E., 4,337,304, Cl. 430-24.000.
Officine Minnetti di Ornella Reveggi & C. S.A.S.: *See*—
Minnetti, Federico, 4,336,875, Cl. 198-486.000.
Ogawa, Akiyoshi: *See*—
Tsukiyama, Yoshifumi; Hatanaka, Yasunori; Ogawa, Akiyoshi; and Mizutani, Hitoshi, 4,336,696, Cl. 464-111.000.
Ogawa, Kazuo, to Rinnai Kabushiki Kaisha. Cooking gas oven. 4,336,789, Cl. 126-21.00A.
Ogiwara, Masaru: *See*—
Saito, Tsuyoshi; and Ogiwara, Masaru, 4,337,038, Cl. 433-32.000.
Ohhata, Michinobu: *See*—
Takahasi, Masauki; Tanaka, Hisami; Yamasawa, Masao; and Ohhata, Michinobu, 4,337,459, Cl. 340-347.0DA.
Ohkouchi, Haruo: *See*—
Ando, Hideo; Hayashi, Akira; Ohkouchi, Haruo; and Kitano, Kyozo, 4,337,165, Cl. 252-105.000.
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Gay, Walter A., 4,337,081, Cl. 71-90.000.
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Phillips, Edward H., 4,336,917, Cl. 248-550.000.
Orlando, Franklin P., to FMC Corporation. Continuous harvester for plants grown in rows. 4,336,682, Cl. 56-330.000.
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Morinaga, Misao, 4,337,320, Cl. 521-137.000.
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Holtermann, Theodore J.; and Scharpf, Otto H., 4,337,054, Cl. 440-89.000.
Stevens, Myron T., 4,337,053, Cl. 440-87.000.
Overfield, Norbert W., to Stanadyne, Inc. Fuel injection pump snubber. 4,336,781, Cl. 123-467.000.
Owens-Illinois, Inc.: *See—*
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Giovanni, Pastrone, 4,336,800, Cl. 128-214.00F.
Oy Wartsila Ab: *See—*
Baltscheffsky, Arne; and Karkkainen, Alpo, 4,336,700, Cl. 70-366.000.
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Totty, Ray S.; Love, Gary N.; and Zolot, Jeffrey L., 4,336,747, Cl. 92-43.000.
Page, Lucille A., to Rose Truck and Caster Company. Caster brake. 4,336,630, Cl. 16-35.00R.
Pagels, Louis T.; and Nagel, Dieter H., to Automatic Liquid Packaging, Inc. Apparatus for molding a container with offset parting line. 4,337,025, Cl. 425-392.000.
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Treasurywala, Adi; Palameta, Bozidar; Bogri, Tibor; and Bagli, Jehan, 4,337,265, Cl. 424-274.000.
Palensky, Frederick J.: *See—*
Melancon, Kurt C.; and Palensky, Frederick J., 4,337,332, Cl. 528-15.000.
Palmer, John E., to United States of America, Army. Night vision training simulator. 4,337,044, Cl. 434-11.000.
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Cap, Heinrich; von der Heide, Johann; and Muller, Rolf, 4,337,424, Cl. 318-328.000.
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Day, Paul L., 4,336,924, Cl. 266-117.000.
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Jorgensen, Richard G.; and Steele, Gerald G., 4,336,820, Cl. 137-100.000.
Parkinson, Ward D., to Mostek Corporation. Backup power circuit for biasing bit lines of a static semiconductor memory. 4,337,524, Cl. 365-229.000.
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Patterson, Dennis O. Apparatus for reproducing coded contour shapes in saw blades. 4,336,725, Cl. 76-25.00R.
Patterson, Robert E. Safety clamp. 4,336,637, Cl. 24-249.0DP.
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Penick, Ib; and Volkert, John K., to Compak System, Inc. Promotional puzzle. 4,336,664, Cl. 40-594.000.
Pereira, Marcel. Construction system. 4,336,675, Cl. 52-267.000.
Perichon, Catherine: *See—*
Cattelani, Claude; and Perichon, Catherine, 4,336,996, Cl. 355-39.000.
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Veneklasen, Lee H., 4,337,422, Cl. 315-383.000.
Perkins, Charles M. Solid fuel burning internal combustion engine. 4,336,771, Cl. 123-23.000.
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Holst, Arno; Perplies, Eberhard; and Buchberger, Gerhard, 4,337,328, Cl. 525-336.000.
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Peter, B. Keith. Speaker system. 4,336,861, Cl. 181-144.000.
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Peters, Dierk D. I-Beam truss structure. 4,336,678, Cl. 52-729.000.
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Petronella, Joseph, to Tenneco Chemicals, Inc. Process for the production of oil-soluble metal salts. 4,337,208, Cl. 260-414.000.
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Angwin, Meredith J.; and Pfefferle, William C., 4,337,028, Cl. 431-7.000.
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Pfizer Inc.: *See—*
Andrews, Glenn C., 4,337,350, Cl. 560-174.000.
Welch, Willard M.; and Harbert, Charles A., 4,337,250, Cl. 424-248.570.
Pharmacia Diagnostics AB: *See—*
McGeeney, Kevin F., 4,337,309, Cl. 435-22.000.
Philip Morris Incorporated: *See—*
Sykes, Larry M.; and Snow, Ray G., 4,336,814, Cl. 131-291.000.
Phillips, Edward H., to Optimetrix Corporation. Shock and vibration isolation system. 4,336,917, Cl. 248-550.000.
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Needham, Donald G., 4,337,182, Cl. 524-609.000.
Solomon, Paul W., 4,337,364, Cl. 568-475.000.
Picheiman, Franklin D.; and Mehl, Donald N., to Flo-Pac Corporation. Squeegee assembly. 4,336,624, Cl. 15-245.000.
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Wessling, Ritchie A.; and Pickelman, Dale M., Sr., 4,337,185, Cl. 524-458.000.
Pickenhagen, Wilhelm, to Firmenich SA. Flavoring with 7-methyl-oct-3-en-2-one. 4,337,277, Cl. 426-534.000.
Pierce, John T., Jr.: *See—*
Clifford, Jack R., 4,337,096, Cl. 134-8.000.
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Ecker, Amir L.; and Pietsch, Joseph A., 4,336,692, Cl. 62-82.000.
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Pion, Russell F., to Factory Mutual Research Corporation. Liquid level control system. 4,336,825, Cl. 137-403.000.
Pioneer Electronic Corporation: *See—*
Hirota, Yoshihisa, 4,337,537, Cl. 369-216.000.
Kamimura, Teturo; Komatsubara, Masahiro; Ando, Shizuo; and Inanaga, Takugi, 4,337,490, Cl. 360-96.600.
Pivar, Stuart, to American Microcar Incorporated. Lightweight canopy for three-wheeled vehicle with low center of gravity. 4,336,964, Cl. 296-78.00R.
Plessey Handel und Investments A.G.: *See—*
Carrier, John A., 4,337,461, Cl. 340-402.000.
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Van der Geer, Josephus J.; Van Pelt, Willem; Ploeger, Marinus; Spoor, Wilhelmus J.; and Van der Steen, Gerardus H. A. M., 4,337,410, Cl. 313-480.000.
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Metzner, Wolfgang; Koddebusch, Hubert; and Poetter, Gerswid, deceased, 4,337,093, Cl. 106-18.330.
Polak, Anthony J., to UOP Inc. Method for increasing the peel strength of metal-clad polymers. 4,337,279, Cl. 427-40.000.
Polaroid Corporation: *See—*
Johnson, Bruce K., 4,336,988, Cl. 354-197.000.
Shenk, Edwin K., 4,336,987, Cl. 354-195.000.
Polson, Robert D. Digital high speed guitar synthesizer. 4,336,734, Cl. 84-1.010.
Pomber, Harry A., to Sounds Alive Systems, Inc. Relay valve assembly for player pianos. 4,336,737, Cl. 84-151.000.
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Laurent, Jean; Monnet, Bernard; and Pertuis, Philippe, 4,337,022, Cl. 425-192.00R.
Pontoni, George E., to Bell & Howell Company. Adjustable tape guiding method and apparatus. 4,336,900, Cl. 226-97.000.

Pontvianne, Jean, to Thomson-CSF. Focusing device with permanent magnets for electron tube and electron tube equipped with such a device. 4,337,413, Cl. 315-3.500.

Popov, Nikolay N.: *See—*
Petrov, Georgi S.; Petkov, Ivan A.; Etropolski, Hristo I.; Dimitrov, Dimiter N.; Popov, Nikolay N.; and Uzunov, Atanas I., 4,337,078, Cl. 71-24.000.

Poppell, Jerry P. Wheel balancing device and method. 4,336,716, Cl. 73-480.000.

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Arold, Hermann; Humburger, Siegbert; Diehr, Hans-Joachim; and Porkert, Helmut, 4,337,359, Cl. 568-21.000.

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Carney, William V.; and Singer, Loren A., Jr., 4,337,495, Cl. 361-119.000.

Porter, Kenneth W., to Combustion Research & Technology, Inc. Constant volume, continuous external combustion rotary engine with piston compressor and expander. 4,336,686, Cl. 60-39.630.

Portescap: *See—*
Oudet, Claude, 4,337,449, Cl. 335-225.000.

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Poulos, Kosta. Non-slip hammer. 4,336,832, Cl. 145-29.00R.

PPG Industries, Inc.: *See—*
Drummond, Warren W., 4,337,073, Cl. 65-1.000.
Schimmel, Karl F.; Seiner, Jerome A.; Dowbenko, Rostyslaw; and Christenson, Roger M., 4,337,184, Cl. 524-726.000.
Shaw, Hugh E., Jr., 4,337,076, Cl. 65-29.000.

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Bodendorf, Warren J.; and Presto, Alphonse R., 4,337,117, Cl. 162-161.000.

Price, Carroll D., II. Carrying sling. 4,336,899, Cl. 224-202.000.

Price, Howard A.: *See—*
Oberth, Adolf E.; and Price, Howard A., 4,337,102, Cl. 149-19.300.

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Noller, Fred W.; and Kramer, James C., 4,336,860, Cl. 180-273.000.

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Prokop, James A., to Lull Engineering Company, Inc. Load-sensing system. 4,336,720, Cl. 73-862.530.

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Delagrange, Arthur D.; Pryor, Cabell N., Jr.; and Wilson, Wayne D., 4,337,527, Cl. 367-98.000.

Pschunder, Willi; and Steinmetz, Gerhard, to Licentia Patent-Verwaltungs-G.m.b.H. Method of contacting a solar cell. 4,336,648, Cl. 29-572.000.

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Queneau, Paul E.; and Schuhmann, Reinhardt, Jr. Method for decreasing metal losses in nonferrous smelting operations. 4,337,086, Cl. 75-69.000.

Quinton, Carrol D.; and Guio, Raphael, to Bunker Ramo Corporation. Barrel plating apparatus. 4,337,135, Cl. 204-213.000.

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Rohlfs, Hans-Adolf; Kling, Alfred; Raab, Guenter; Vogt, Michael; Specht, Viktor; and Schaetzke, Ulrike, 4,337,214, Cl. 260-502.500.

Raab, Simon. Bone connective prostheses adapted to maximize strength and durability of prostheses-bone cement interface; and methods of forming same. 4,336,618, Cl. 3-1.913.

Radwill, Robert P., to AMSTED Industries Incorporated. Railroad car sill-articulating device member connection. 4,336,758, Cl. 105-4.00R.

Raffelson, Harold: *See—*
Mount, Ramon A.; and Raffelson, Harold, 4,337,174, Cl. 252-437.000.

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Falkowski, Paul P.; Spotz, Erwin; and Rajadhyaksha, Mangesh, 4,337,219, Cl. 264-130.000.

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Ramirez, Enrique G., to Dow Chemical Company, The. Catalyst for the preparation of ethylenimine. 4,337,175, Cl. 252-455.00R.

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Rigler, Josef K.; Ratajczak, Hans-Josef; Leithauser, Horst; and Trukenbrod, Karl, 4,337,319, Cl. 521-96.000.

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Rawlings, James E.: *See—*
Cox, Robert N.; and Rawlings, James E., 4,336,892, Cl. 221-125.000.

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Blair, W. Roscoe, 4,336,944, Cl. 277-81.00R.

Raychem Corporation: *See—*
Harrison, John D., 4,337,090, Cl. 148-402.000.

Raymond, James W. Keying process for resettable lock. 4,336,701, Cl. 70-395.000.

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Giordano, Raymond L., 4,337,423, Cl. 318-280.000.
Harlan, Wayne E., 4,337,478, Cl. 358-20.000.
Stewart, Roger G., 4,337,522, Cl. 365-190.000.
Taylor, Byron K., 4,337,536, Cl. 369-126.000.

Rea, James H.: *See—*
Karim, Khalid A.; and Rea, James H., 4,337,297, Cl. 428-461.000.
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Read, Owen R. Adjustable lifting tong. 4,336,962, Cl. 294-106.000.

Rector, Malcolm B., Jr., to Xerox Corporation. $MgF_2$ Coating for promoting adherence of thin films to single crystal materials. 4,336,982, Cl. 350-358.000.

Red Fox Industries Inc.: *See—*
Crosby, Gary A., 4,337,151, Cl. 210-139.000.

Reed, Kenneth J.; and Lythgoe, Alan L. Water release transfer. 4,337,289, Cl. 428-195.000.

Reed, Ronald L.; and Carpenter, Clarence W., Jr., to Exxon Production Research Company. Shear-stabilized emulsion flooding process. 4,337,159, Cl. 252-8.55D.

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Jackson, Jay W., 4,337,009, Cl. 405-212.000.

Reiff, Helmut; and Dieterich, Dieter, to Bayer Aktiengesellschaft. Substituted polyisocyanate or polyisocyanate mixtures of the diphenyl methane series containing chlorosulfonyl groups. 4,337,333, Cl. 528-67.000.

Reiter, Gerhard, to Timken Company, The. Unitized multirow tapered roller bearing. 4,336,971, Cl. 308-187.200.

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Huykman, Richard B., 4,337,494, Cl. 361-86.000.

Repke, Virginia L., to Johnson & Johnson Baby Products Company. Shaped absorbent pad for disposable diapers. 4,336,803, Cl. 128-287.000.

Repla Limited: *See—*
Bucci, Carlo G., 4,336,645, Cl. 29-510.000.

Research Corporation: *See—*
Oeschger, Max P.; Hooke, Anne M.; and Bellanti, Joseph A., 4,337,314, Cl. 435-253.000.
Stoner, Glenn E.; and Cahen, George L., Jr., 4,337,138, Cl. 204-290.00R.

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Hays, Lance G.; Studhalter, Walter R.; and Ritzi, Emil W., 4,336,693, Cl. 62-116.000.

Richert, Manfred; and Storandt, Ralf, to Vereinigte Baubeschlagfabriken Gretsch & Co. GmbH. Safety toe unit for a ski binding. 4,336,956, Cl. 280-625.000.

Richter, Gerhard: *See—*
Mund, Konrad; Richter, Gerhard; and Weidlich, Erhard, 4,337,501, Cl. 361-433.000.

Ricketts, Thomas E., to Occidental Oil Shale, Inc. Cratering in the deep cratering region to form an in situ oil shale retort. 4,336,966, Cl. 299-2.000.

Ricoh Co., Ltd.: *See—*
Fukushima, Yoshio, 4,337,394, Cl. 250-237.00G.
Imamura, Tomoatsu, 4,337,426, Cl. 318-599.000.
Mizuno, Akinori, 4,337,468, Cl. 346-1.100.
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Koppern, Heinz; Bergendahl, Hans-Georg; Rieschel, Hartmut; and Koch, Friedhelm, 4,337,023, Cl. 425-237.000.

Rigler, Josef K.; Ratajczak, Hans-Josef; Leithauser, Horst; and Trukenbrod, Karl, to Chemische Werke Huls AG. Self-extinguishing, fine particulate expandable styrene polymers. 4,337,319, Cl. 521-96.000.

Ringwood, Alfred E.: *See—*
Bird, John M.; and Ringwood, Alfred E., 4,337,167, Cl. 252-633.000.

Rink, Norbert: *See—*
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Ripley, John A.: *See—*
Anderson, Donald L.; Cherry, Isaac R.; Ripley, John A.; and Tanaka, David T., 4,336,810, Cl. 128-702.000.

Rittler, Hermann L., to Corning Glass Works. Borosilicate, opal glass article. 4,337,295, Cl. 428-410.000.

Ritzi, Emil W.: *See—*
Hays, Lance G.; Studhalter, Walter R.; and Ritzi, Emil W., 4,336,693, Cl. 62-116.000.

Robert Bosch GmbH: *See—*
Binder, Georg, 4,337,406, Cl. 310-91.000.
Schneider, Erich; Fleischer, Helmut; Nonnenmann, Wolfgang; and Gerum, Benno, 4,337,511, Cl. 364-426.000.
Wanner, Karl, 4,336,848, Cl. 173-139.000.
Zirps, Wilhelm, 4,336,903, Cl. 236-92.00R.

Roberts, Sallie S.: *See—*
Sentell, Samuel W.; Mendenhall, Jean S.; Roberts, Sallie S.; and Sentell, C. Sherburne, Jr., 4,336,801, Cl. 128-239.000.

Roberts, Sidney, to Thermatool Corp. Method for the processing of heat exchanger, tube-strip elements. 4,336,643, Cl. 29-157.30C.

Robertshaw Controls Company: *See—*
Fox, Raymond J., 4,337,451, Cl. 337-93.000.

Robertson, Duane D. Cutting tool for flexible plastic conduit. 4,336,652, Cl. 30-258.000.

Robeson, Lloyd M., to Union Carbide Corporation. Blends of water soluble polyethers and poly(hydroxyethers)s. 4,337,330, Cl. 525-407.000.

Robinson, Martin A.: *See—*
Anello, Louis G.; Van Der Puy, Michael; Robinson, Martin A.; and Eibeck, Richard E., 4,337,361, Cl. 568-386.000.

Roche, Charles W., to Uni-Flange Corporation. Joint restrainer system. 4,336,959, Cl. 285-368.000.

Rochman, Arnold. Vehicle with a balancing plane. 4,336,952, Cl. 280-87.010.

Rockwell International Corporation: *See—*
Jones, Addison B., 4,337,132, Cl. 204-192.00E.
Wagner, William R.; Wright, David E.; and Binsley, Robert L., 4,336,839, Cl. 166-59.000.

Rodemann, Alfred H.; and Breglia, Denis R., to United States of America, Navy. Holographic storage of terrain data. 4,336,976, Cl. 350-3.750.

Roeder, Robert J., to Kimberly-Clark Corporation. Sanitary napkin with garment suspension adhesive but without release paper covering. 4,336,804, Cl. 128-290.00R.

Rohde, Wilhelm, to Linde Aktiengesellschaft. Continuous system of rectification. 4,337,070, Cl. 62-18.000.

Rohlfs, Hans-Adolf; Kling, Alfred; Raab, Guenter; Vogt, Michael; Specht, Viktor; and Schaetzke, Ulrike, to Benckiser-Knapsack GmbH. N-(Hydroxy methyl)-1-amino alkane-1,1-diphosphonic acids, process of making same, and composition for and method of using same as stabilizing agents in peroxide-containing bleaching baths. 4,337,214, Cl. 260-502.500.

Rollei-Werke Franke & Heidecke GmbH & Co. KG: *See—*
Prochnow, Claus, 4,336,986, Cl. 354-187.000.

Rollot, Pierre H.; Cordier, Jean A.; and Briche, Raymond L., to Technilor; and Usinor. Device for fixing and sealing stave plates for a blast furnace. 4,336,925, Cl. 266-193.000.

Romeas, Rene: *See—*
Oprandi, Pierre; and Romeas, Rene, 4,337,532, Cl. 369-45.000.

Rooney, Clarence S.; Williams, Haydn W. R.; Cragoe, Edward J., Jr.; and Patchett, Arthur A., to Merck & Co., Inc. 2,4-Dioxo-4-substituted-1-butanoic acid derivatives useful in treating urinary tract calcium oxalate lithiasis. 4,337,258, Cl. 424-263.000.

Rorer, David L.; and Hardin, Jasper E., to Teledyne Industries, Inc. Aircraft battery. 4,337,301, Cl. 429-179.000.

Rose Truck and Caster Company: *See—*
Jarvis, Grover F., Jr.; and Arold, George E., 4,336,629, Cl. 16-35.00R.
Page, Lucille A., 4,336,630, Cl. 16-35.00R.

Rosen, William E.: *See—*
Berke, Philip A.; and Rosen, William E., 4,337,269, Cl. 424-289.000.

Rosler, Helmut, to Siemens Aktiengesellschaft. Monolithically integrable semiconductor memory. 4,337,526, Cl. 365-238.000.

Ross, Abraham. Grooming apparatus. 4,336,815, Cl. 132-143.000.

Ross, Dieter; and Baumgartner, Viktor, to Erwin Sick GmbH Optik-Electronik. Change of distance measuring apparatus. 4,336,997, Cl. 356-4.000.

Ross, Sidney D.: *See—*
Russell, Philip G.; Bernard, Walter J.; and Ross, Sidney D., 4,337,114, Cl. 156-656.000.

Roussel UCLAF: *See—*
Allais, Andre; Clemence, Francois; Meier, Jean; and Deraedt, Roger, 4,337,353, Cl. 562-460.000.

Ruell, Hartwig, to Siemens Corporation. Fingerprint transducer and reading apparatus. 4,336,998, Cl. 356-71.000.

Ruggeri, Robert T.: *See—*
Beck, Theodore R.; and Ruggeri, Robert T., 4,336,811, Cl. 128-784.000.

Ruhrchemie Aktiengesellschaft: *See—*
Bahrmann, Helmut; Cornils, Boy; Frohning, Carl D.; and Weber, Jurgen, 4,337,363, Cl. 568-444.000.

Ruhs, Alexander; Schwarz, Rudolf; and Kleinschmit, Peter, to Degussa Aktiengesellschaft. Process for the production of titanium disulfide of high purity and stoichiometric composition. 4,337,239, Cl. 423-561.00R.

Russell, Philip G.; Bernard, Walter J.; and Ross, Sidney D., to Sprague Electric Company. Nodular copper removal from aluminum foil surfaces. 4,337,114, Cl. 156-656.000.

Rutherford, Joseph P. Agricultural inoculant composition. 4,337,077, Cl. 71-9.000.

S.K.Y. Polymers, Inc.: *See—*
Stoy, Vladimir A., 4,337,327, Cl. 525-280.000.

Sadatoshi, Hajime: *See—*
Shiga, Akinobu; Kakugo, Masahiro; Sadatoshi, Hajime; Wakamatsu, Kazuki; and Yoshioka, Hiroshi, 4,337,326, Cl. 525-244.000.

Sagishima, Takayuki; and Kitani, Teruo, to Matsushita Electric Industrial Co., Ltd. Color demodulating apparatus. 4,337,477, Cl. 358-18.000.

Sahyun, Melville R. V.; Chen, Tsung-I; King, Timothy W.; Mikelsons, Valdis; and Mitra, Smarajit, to Minnesota Mining and Manufacturing Company. Transfer, encapsulating, and fixing of toner images. 4,337,303, Cl. 430-11.000.

Saito, Tsuyoshi; and Ogiwara, Masaru, to M-S Surgical Mfg. Co., Ltd. Electrolytic implement and method for removing metal pieces left in root canals of teeth. 4,337,038, Cl. 433-32.000.

Sakaguchi, Susumu: *See—*
Shikita, Takuji; and Sakaguchi, Susumu, 4,336,617, Cl. 3-1.900.

Sakamoto, Takahide: *See—*
Hiroshima, Tatsuo; and Sakamoto, Takahide, 4,337,099, Cl. 148-9.500.
Shiraiwa, Toshio; Hiroshima, Tatsuo; and Sakamoto, Takahide, 4,336,923, Cl. 266-51.000.

Sakito, Yoji: *See—*
Mukaiyama, Teruaki; Sakito, Yoji; and Asami, Masatoshi, 4,337,346, Cl. 548-324.000.

Saklad, Eugene L., to New England Nuclear Corporation. Denatured albumin complexes for radioscintigraphic imaging and evaluation of reticuloendothelial systems. 4,337,240, Cl. 424-1.000.

Sakowski, Walter J.; Shaffer, John H.; and Carty, Larry G., to Olin Corporation. Process for manufacture of calcium hypochlorite. 4,337,236, Cl. 423-474.000.

Sakurai, Mikio; Yoshimoto, Yuichiro; and Kodama, Hiroshi, to Hitachi, Ltd. Nuclear reactor power monitoring system. 4,337,118, Cl. 376-210.000.

Sakwa, Sydney M. Pen pill container. 4,336,882, Cl. 206-537.000.

Sample, Thomas E., Jr., to Dresser Industries, Inc. Acid soluble weighting agent for well drilling, workover and completion fluids. 4,337,160, Cl. 252-8.50B.

Sanders, Robert J.: *See—*
Fuller, Robert T.; and Sanders, Robert J., 4,336,888, Cl. 211-45.000.

Sandoz Ltd.: *See—*
Sorg, Dieter; and Leutwiler, Albert, 4,337,198, Cl. 260-243.300.

Sandvik AB: *See—*
Lewis, H. Glenn, 4,336,656, Cl. 33-174.00E.

Sanemitsu, Yuzuru: *See—*
Hashimoto, Shunichi; Oshio, Hiromichi; Mizutani, Masato; Sanemitsu, Yuzuru; Katoh, Haruhiko; and Sumida, Seizo, 4,337,082, Cl. 71-93.000.

Sano, Hitoshi: *See—*
Omi, Yasuo; Wada, Takanori; Sano, Hitoshi; Sato, Shigekatsu; Ido, Kazuo; Taneda, Kozo; and Naka, Junichi, 4,337,021, Cl. 425-142.000.

Sanraku-Ocean Co., Ltd.: *See—*
Oki, Toshikazu; Yoshimoto, Akihiro; Kouno, Kageaki; Inui, Taiji; Takeuchi, Tomio; and Umezawa, Hamao, 4,337,312, Cl. 435-78.000.
Yoshioka, Takeo; Yamamoto, Kenichi; Yamada, Kaoru; Kato, Yasuyuki; Shimauchi, Yasutaka; and Ishikura, Tomoyuki, 4,337,199, Cl. 260-245.20T.

Santiago, Edgardo, to Owens-Illinois, Inc. Polyurethane and polyethylene resin-containing printing ink having improved physical and mechanical properties. 4,337,183, Cl. 524-446.000.

Sarkisian, George M.: *See—*
Hubbard, James R.; Sarkisian, George M.; and Scanlon, John J., 4,337,471, Cl. 346-140.00R.

Sasaki, Hideharu; Tamura, Yorikazu; and Shimada, Keizo, to Teijin Limited. Chemical-resistant wholly aromatic polyamide fiber material. 4,337,155, Cl. 210-500.100.

Sato, Shigekatsu: *See—*
Omi, Yasuo; Wada, Takanori; Sano, Hitoshi; Sato, Shigekatsu; Ido, Kazuo; Taneda, Kozo; and Naka, Junichi, 4,337,021, Cl. 425-142.000.

Satoh, Michitaka: *See—*
Suzuki, Yasushi; Tsukamoto, Kunio; Minami, Nobuyoshi; Hasegawa, Yukio; Satoh, Michitaka; Yamamoto, Norio; Miyasaka, Katsuhiko; Mikami, Takashi; and Funakoshi, Satoshi, 4,337,256, Cl. 424-258.000.

Satomi, Seigo, to NGK Insulators, Ltd. Silencer in gas flow passage. 4,336,863, Cl. 181-224.000.

Scanlon, John J.: *See—*
Hubbard, James R.; Sarkisian, George M.; and Scanlon, John J., 4,337,471, Cl. 346-140.00R.

Scardera, Michael; and Norwid, Alan, to Olin Corporation. Alkoxysilane cluster emulsions and their preparation. 4,337,168, Cl. 252-312.000.

Schaetzke, Ulrike: *See—*
Rohlfs, Hans-Adolf; Kling, Alfred; Raab, Guenter; Vogt, Michael; Specht, Viktor; and Schaetzke, Ulrike, 4,337,214, Cl. 260-502.500.

Schaller, Maurice, to Levolor Lorentzen, Inc. Venetian blind. 4,336,834, Cl. 160-168.00A.

Scharpf, Otto H.: *See—*
Holtermann, Theodore J.; and Scharpf, Otto H., 4,337,054, Cl. 440-89.000.

Schering Aktiengesellschaft: *See—*
Petzoldt, Karl; Steinbeck , Hermann; and Elger, Walter, 4,337,311, Cl. 435-54.000.

Schering Corporation: *See—*
Nagabhushan, Tattanahalli L.; Turner, William N.; and Cooper, Alan, 4,337,335, Cl. 536-13.600.

Schiemann, Wolfram. Plastic containers, particularly canisters. 4,337,286, Cl. 428-36.000.

Schilling, Walter: *See—*
Zweifel, Hans; Schilling, Walter; Storni, Angelo; and Bellus, Daniel, 4,337,200, Cl. 548-451.000.

Schilp, Ulrich, to Lever Brothers Company. Liquid, thickened chlorine bleaching composition. 4,337,163, Cl. 252-96.000.

Schimmel, Karl F.; Seiner, Jerome A.; Dowbenko, Rostyslaw; and Christenson, Roger M., to PPG Industries, Inc. Urethane rheology modifiers substantially free of terminal hydrophobic groups and compositions containing same. 4,337,184, Cl. 524-726.000.

Schlemmer, Robert: *See—*
Cohen, Sidney; and Schlemmer, Robert, 4,336,760, Cl. 111-11.000.

Schmid, Karlheinz, to Gebrueder Heller, Maschinenfabrik GmbH. Crankshaft milling machine. 4,337,011, Cl. 409-199.000.

Schmidt, Hans, to Marker, Hannes. Safety ski binding. 4,336,955, Cl. 280-618.000.

Schmidt, Paul J.; and Hung, William M., to Sterling Drug Inc. Processes for preparing substituted furopyridinones and furopyrazinones. 4,337,340, Cl. 544-350.000.

Schmitt, Frederick L.: *See—*
Kiwala, Jacob; Tokarzewski, Richard J.; Schmitt, Frederick L.; and Sprecker, Mark A., 4,337,180, Cl. 252-522.00R.

Schmitt, Georg; and Gostl, Georg, to Linde Aktiengesellschaft. Spraying system for cryogenic coolants. 4,336,694, Cl. 62-374.000.

Schneider, Adolf: *See—*
Horn, Kurt; Muller, Walter; and Schneider, Adolf, 4,336,743, Cl. 89-37.00B.

Schneider, Erich; Fleischer, Helmut; Nonnenmann, Wolfgang; and Gerum, Benno, to Robert Bosch GmbH. Digital control apparatus for the running speed of a motor vehicle. 4,337,511, Cl. 364-426.000.

Schoeck, Donald I.: *See—*
Hanagan, Michael W.; and Schoeck, Donald I., 4,336,934, Cl. 272-72.000.

Schreiber, Charles J., to Hornady Manufacturing Company. Jacketed bullet and method of manufacture. 4,336,756, Cl. 102-516.000.

Schubert & Salzer: *See—*
Bock, Erich; Wulfhorst, Burkhard; Hini, Eugen; and Grupp, Bernhard, 4,336,683, Cl. 57-18.000.

Schuh, Bernhard: *See—*
Hasler, Alfred; and Schuh, Bernhard, 4,337,491, Cl. 360-97.000.

Schuhmann, Reinhardt, Jr.: *See—*
Queneau, Paul E.; and Schuhmann, Reinhardt, Jr., 4,337,086, Cl. 75-69.000.

Schultz, Bengt I.; and Svensson, Goran, to AB Volvo. Passive safety belt system for motor vehicles. 4,336,957, Cl. 280-803.000.

Schulz, Horst: *See—*
Kahlert, Peter; Dittmann, Norbert; Fink, Heiner; Junker, Frank; Lehmann, Gunter; Schulz, Horst; Johne, Hans; Jentzsch, Arndt; and Kuhnert, Werner, 4,336,969, Cl. 308-61.000.

Schwartz, Donald R.; and Baumgard, Stuart H. Disposable orthopedic overmattress for articulated beds. 4,336,621, Cl. 5-446.000.

Schwarz, Rudolf: *See—*
Ruhs, Alexander; Schwarz, Rudolf; and Kleinschmit, Peter, 4,337,239, Cl. 423-561.00R.

Schweitzer, Ernest D., to Candel Industries, Limited. Method and apparatus for sampling waste gases. 4,336,722, Cl. 73-863.120.

Schwickert, Russell C.: *See—*
Monaghan, Kevin J.; and Schwickert, Russell C., 4,336,977, Cl. 350-96.200.

Scientific Pharmaceuticals, Inc.: *See—*
Orlowski, Jan A.; Butler, David V.; and Kidd, Patrick D., 4,337,349, Cl. 560-30.000.

SCM Corporation: *See—*
Cappotto, Samuel D., 4,337,001, Cl. 400-208.000.

Scott & Fetzer Company, The: *See—*
Hone, Ronald D.; Harris, William; and Edwards, James D., 4,336,626, Cl. 15-319.000.

Scribner, Belding H.: *See—*
Babb, Albert L.; and Scribner, Belding H., 4,336,881, Cl. 206-525.000.

Searle, Clifford A. Apparatus for manufacture of sleeves and/or pockets for separator plates. 4,337,113, Cl. 156-353.000.

Securax, Inc.: *See—*
Thomas, Robert E., 4,336,885, Cl. 211-4.000.

Sedlak, Vaclav: *See—*
Cerny, Arnost; Fiser, Jiri; Jiruse, Jaroslav; and Sedlak, Vaclav, 4,336,930, Cl. 271-277.000.

Seeholzer, Ursula, heiress: *See—*
Metzner, Wolfgang; Koddebusch, Hubert; and Poetter. Gerswid, deceased, 4,337,093, Cl. 106-18.330.

Seiler, Edwin N., to Bell Telephone Laboratories, Incorporated. Solar heating freeze protection system. 4,336,792, Cl. 126-420.000.

Seiner, Jerome A.: *See—*
Schimmel, Karl F.; Seiner, Jerome A.; Dowbenko, Rostyslaw; and Christenson, Roger M., 4,337,184, Cl. 524-726.000.

Seki, Mikio. Snell coiling device. 4,336,960, Cl. 289-17.000.

Sekiya, Setsuro: *See—*
Sumiyoshi, Masaharu; Sekiya, Setsuro; Motosugi, Katsuhiko; Takahashi, Hiroshi; and Toyoda, Shuhei, 4,336,776, Cl. 123-306.000.

Semence, Pierre, to Societe Industrielle de Brevets et d'Etudes S.I.B.E. Carburation devices. 4,336,779, Cl. 123-339.000.

Sempliner, Arthur T.: *See—*
Teague, Walter D., Jr.; and Sempliner, Arthur T., 4,336,622, Cl. 15-22.00R.

Sentell, C. Sherburne, Jr.: *See—*
Sentell, Samuel W.; Mendenhall, Jean S.; Roberts, Sallie S.; and Sentell, C. Sherburne, Jr., 4,336,801, Cl. 128-239.000.

Sentell, Samuel W.; Mendenhall, Jean S.; Roberts, Sallie S.; and Sentell, C. Sherburne, Jr. Douche nozzle. 4,336,801, Cl. 128-239.000.

Ser, Jean-Claude; Zabotto, Arlette; Zaffran, Christian; and Koulbanis, Constantin, to L'Oreal S.A. Emulsions of the water-in-oil or oil-in-water type and cosmetic products using these emulsions. 4,337,241, Cl. 424-59.000.

Seragnoli, Enzo, to G.D. Societa per Azioni. Machine for simultaneously producing two continuous cigarette rods. 4,336,812, Cl. 131-84.00R.

Seragnoli, Enzo, to G.D. Societa per Azioni. Strip guiding device, particularly for cigarette making machines. 4,336,813, Cl. 131-84.00C.

Setescak, Linda L.: *See—*
Shutske, Gregory M.; Setescak, Linda L.; and Allen, Richard C., 4,337,261, Cl. 424-272.000.

Shaffer, John H.: *See—*
Sakowski, Walter J.; Shaffer, John H.; and Carty, Larry G., 4,337,236, Cl. 423-474.000.

Shah, Kishore R., to Kendall Company, The. Pressure-sensitive adhesive. 4,337,325, Cl. 525-205.000.

Shapiro, Rosella. Umbrella having a pocket compartment. 4,336,817, Cl. 135-16.000.

Sharp Kabushiki Kaisha: *See—*
Funada, Fumiaki; Matsuura, Masataka; and Wada, Tomio, 4,336,980, Cl. 350-345.000.
Hatta, Koiti, 4,337,047, Cl. 434-201.000.
Shimizu, Youiti; Tsumura, Takeo; Matsumoto, Tadashi; and Nakai, Syunzi, 4,337,472, Cl. 346-155.000.
Takano, Rikuo; and Sumitomo, Yuji, 4,337,469, Cl. 346-75.000.

Shaw, Hugh E., Jr., to PPG Industries, Inc. Ribbon edge detector and system for metering flow of molten glass. 4,337,076, Cl. 65-29.000.

Shea Inventive Designs: *See—*
Shea, Robert H., 4,336,870, Cl. 192-105.0CF.

Shea, Robert H., to Shea Inventive Designs. Torque exchange coupling. 4,336,870, Cl. 192-105.0CF.

Shell Oil Company: *See—*
Boersma, Michael A. M.; Nanne, Johannes M.; and Post, Martin F. M., 4,337,176, Cl. 252-459.000.

Shenk, Edwin K., to Polaroid Corporation. Camera employing zone focusing. 4,336,987, Cl. 354-195.000.

Sherex Chemical Company, Inc.: *See—*
Escalera, Saul J., 4,337,149, Cl. 209-166.000.

Sherman, Donald R.: *See—*
Arnold, Arthur K.; and Sherman, Donald R., 4,336,715, Cl. 73-462.000.

Sherwood Medical Industries Inc.: *See—*
Gindler, E. Melvin, 4,337,064, Cl. 23-230.00B.

Shiga, Akinobu; Kakugo, Masahiro; Sadatoshi, Hajime; Wakamatsu, Kazuki; and Yoshioka, Hiroshi, to Sumitomo Chemical Company, Limited. Process for producing propylene-ethylene block copolymers. 4,337,326, Cl. 525-244.000.

Shikita, Takuji; and Sakaguchi, Susumu, to Shin-Etsu Chemical Company Limited; and Siemens Aktiengesellschaft. Prosthetic substituted member for living body and a method for the surgical treatment by use thereof. 4,336,617, Cl. 3-1.900.

Shimada, Keizo: *See—*
Sasaki, Hideharu; Tamura, Yorikazu; and Shimada, Keizo, 4,337,155, Cl. 210-500.100.

Shimada, Toshikazu: *See—*
Urneda, Jun-ichi; Shimada, Toshikazu; Nakamura, Michiharu; Katayama, Yoshifumi; Kajimura, Takashi; and Yamashita, Shigeo, 4,337,443, Cl. 372-49.000.

Shimada, Yoichi: *See—*
Ohno, Mitio; Shimada, Yoichi; Furuhata, Hiroshi; Kanno, Ryoichi; Kodaira, Kuniyasu; and Matumoto, Hirozi, 4,336,808, Cl. 128-663.000.

Shimauchi, Yasutaka: *See—*
Yoshioka, Takeo; Yamamoto, Kenichi; Yamada, Kaoru; Kato, Yasuyuki; Shimauchi, Yasutaka; and Ishikura, Tomoyuki, 4,337,199, Cl. 260-245.20T.

Shimazaki, Tetsuro, to Mitsubishi Paper Mills, Ltd. Process for producing microcapsules. 4,337,169, Cl. 252-316.000.

Shimizu, Yoshiro; Itakura, Toshio; Iwasa, Mitsuhiro; and Hanauye, Kunio, to Mitsui Toatsu Chemicals Inc. Process for production of phenolic resin from bisphenol-A by-products. 4,337,334, Cl. 528-137.000.

Shimizu, Youiti; Tsumura, Takeo; Matsumoto, Tadashi; and Nakai, Syunzi, to Sharp Kabushiki Kaisha. Recording head for use in electrostatic recorders. 4,337,472, Cl. 346-155.000.

Shin-Etsu Chemical Company Limited: *See—*
Ishihara, Toshinobu; Yamamoto, Akira; and Taguchi, Kenichi, 4,337,372, Cl. 568-906.000.
Shikita, Takuji; and Sakaguchi, Susumu, 4,336,617, Cl. 3-1.900.
Takamizawa, Minoru; Okada, Fumio; and Aoki, Hisashi, 4,337,348, Cl. 556-436.000.

Shinhama, Masaaki: *See—*
Uejo, Hirozo; Ishida, Hideo; and Shinhama, Masaaki, 4,337,179, Cl. 252-511.000.

Shinomiya, Masami: *See—*
Fuzioka, Keizi; and Shinomiya, Masami, 4,336,833, Cl. 152-353.00G.

Shiotani, Hiromi: *See—*
Ishiguro, Yoshihiko; Ishiguro, Keiko; and Shiotani, Hiromi, 4,336,636, Cl. 24-115.00M.

Shiraiwa, Toshio; Hiroshima, Tatsuo; and Sakamoto, Takahide, to Sumitomo Metal Industries, Ltd. Steel surface inspection apparatus. 4,336,923, Cl. 266-51.000.

Shogren, David K.: *See—*
Durbin, John A.; and Shogren, David K., 4,336,995, Cl. 355-8.000.

Shortland Engineering International Anstalt: *See—*
Mohlmann, Hans H., 4,336,890, Cl. 215-272.000.

Shutske, Gregory M.; Setescak, Linda L.; and Allen, Richard C., to Hoechst-Roussel Pharmaceuticals Inc. (1,2-Benzisoxazol)phenoxyacetic acids as diuretics. 4,337,261, Cl. 424-272.000.

Siemens Aktiengesellschaft: *See—*
Mund, Konrad; Richter, Gerhard; and Weidlich, Erhard, 4,337,501, Cl. 361-433.000.
Rosler, Helmut, 4,337,526, Cl. 365-238.000.
Shikita, Takuji; and Sakaguchi, Susumu, 4,336,617, Cl. 3-1.900.
Siemens Corporation: *See—*
Ruell, Hartwig, 4,336,998, Cl. 356-71.000.
Sih, John C.: *See—*
Axen, Udo F.; and Sih, John C., 4,337,203, Cl. 549-396.000.
Axen, Udo F.; and Sih, John C., 4,337,337, Cl. 542-426.000.
Axen, Udo F.; and Sih, John C., 4,337,338, Cl. 542-426.000.
Silvey, Elmer R. Chain stop for saw chain grinder. 4,336,726, Cl. 76-25.00A.
Simonnot, Jack: *See—*
Jardinier, Pierre; and Simonnot, Jack, 4,336,904, Cl. 236-92.00R.
Simons, Carel A.: *See—*
Van Megen, Everardus A.; Simons, Carel A.; and Moen, Eduard W., 4,337,535, Cl. 369-121.000.
Simpson, Colin V. M. Electronic earring. 4,337,504, Cl. 362-104.000.
Sinclair, A. Richard: *See—*
Graham, John W.; Sinclair, A. Richard; and Brandt, John L., 4,336,842, Cl. 166-276.000.
Singer, Carl M.; Oana, Mateiu J.; and Turko, John D., to Commercial Shearing, Inc. Rotary impeller pump or motor with counterbalancing chamber in thrust plate bearing counterbore. 4,337,018, Cl. 418-132.000.
Singer Company, The: *See—*
Hatch, James E.; and Gannaway, Thomas W., 4,337,048, Cl. 434-219.000.
Singer, Loren A., Jr.: *See—*
Carney, William V.; and Singer, Loren A., Jr., 4,337,495, Cl. 361-119.000.
Sinyavskaya, Vera M.: *See—*
Kulyabko, Valery A.; Sinyavskaya, Vera M.; Sivkov, Alexandr A.; and Gavrilov, Evgeny N., 4,337,008, Cl. 405-127.000.
Sivkov, Alexandr A.: *See—*
Kulyabko, Valery A.; Sinyavskaya, Vera M.; Sivkov, Alexandr A.; and Gavrilov, Evgeny N., 4,337,008, Cl. 405-127.000.
Sjostrand, Sven E.: *See—*
Junggren, Ulf K.; and Sjostrand, Sven E., 4,337,257, Cl. 424-263.000.
Sletzinger, Meyer, to Merck & Co., Inc. Process for preparing methylvanillyl ketone from isoeugenol. 4,337,360, Cl. 568-322.000.
Smirmaul, Heinz. Corneal trephine. 4,336,805, Cl. 128-310.000.
Smith, Albert B.: *See—*
Azoulay, Moshe; and Smith, Albert B., 4,336,886, Cl. 211-13.000.
Smith, Arthur B.: *See—*
Pytlewski, Louis L.; Krevitz, Kenneth; and Smith, Arthur B., 4,337,368, Cl. 568-730.000.
Smith, Donald J., to Communications Technology Corporation. Service wire splice enclosure. 4,337,374, Cl. 174-138.00F.
Smith Engineering: *See—*
Smith, Jay, III; and Moskin, Jeffrey M., 4,337,460, Cl. 340-384.00E.
Smith, Jack D., to Smithy, Inc. Adapter closure. 4,336,891, Cl. 215-276.000.
Smith, Jackson H., to Eaton Corporation. Speed control trigger switch. 4,337,425, Cl. 318-345.00G.
Smith, Jay, III; and Moskin, Jeffrey M., to Smith Engineering. Hand-held sound effects device. 4,337,460, Cl. 340-384.00E.
Smith, Richard A. G., to Beecham Group Limited. Enzyme derivatives for use in the treatment of venous thrombosis. 4,337,244, Cl. 424-94.000.
Smith, Richard E.; Wenthe, Stephen J., Jr.; and Woznicki, William J., to Xerox Corporation. Method for feeding documents to a copy machine. 4,336,928, Cl. 271-3.100.
Smith, Robert A., to Imperial Chemical Industries Limited. Underwater erosion control structure. 4,337,007, Cl. 405-24.000.
Smith, William R., to Caere Corporation. Apparatus for processing video signals received from an optical scanner. 4,337,455, Cl. 340-146.3AG.
Smithy, Inc.: *See—*
Smith, Jack D., 4,336,891, Cl. 215-276.000.
Snamprogetti S.p.A.: *See—*
Fattore, Vittorio; Manara, Giovanni; and Notari, Bruno, 4,337,366, Cl. 568-698.000.
SNIA Viscosa S.p.A. - Societa' Nazionale Industria Applicazioni Viscosa: *See—*
Leoni, Roberto; Baldini, Alberto; Calloni, Angelo; and Angelini, Gianfranco, 4,337,095, Cl. 106-203.000.
Snow Brand Milk Products Co., Ltd.: *See—*
Omi, Yasuo; Wada, Takanori; Sano, Hitoshi; Sato, Shigekatsu; Ido, Kazuo; Taneda, Kozo; and Naka, Junichi, 4,337,021, Cl. 425-142.000.
Snow, Ray G.: *See—*
Sykes, Larry M.; and Snow, Ray G., 4,336,814, Cl. 131-291.000.
Soboroff, David M.; Troyer, Jerry D.; and Cochran, Andrew A., to United States of America, Interior. Regeneration of waste metallurgical process liquor. 4,337,129, Cl. 204-151.000.
Soca, Serge: *See—*
Favreau, Michel; Bajon, Jean; Cattoen, Michel; Soca, Serge; Longuet, Maurice; and Delattre, Christian, 4,337,514, Cl. 364-515.000.
Societe a Responsabilite Limitee Eram Industrie: *See—*
Biotteau, Gerard, 4,337,292, Cl. 428-141.000.
Societe Anonyme dite: L'OREAL: *See—*
Bugaut, Andree; and Andrillon, Patrick, 4,337,061, Cl. 8-405.000.
Societe Anonyme Francaise du Ferodo: *See—*
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Societe d'Etudes et de Recherches de Ventilation et d'Aeraulique S.E.R.V.A.: *See—*
Jardinier, Pierre; and Simonnot, Jack, 4,336,904, Cl. 236-92.00R.
Societe Industrielle de Brevets et d'Etudes S.I.B.E.: *See—*
Semence, Pierre, 4,336,779, Cl. 123-339.000.
Sohnius, Heinrich. Anchor bolt expansion shell. 4,337,012, Cl. 411-67.000.
Solmat Systems, Ltd.: *See—*
Assaf, Gad, 4,336,999, Cl. 366-101.000.
Solomon, Frank, to Diamond Shamrock Corporation. Strengthening of carbon black-teflon-containing electrodes. 4,337,140, Cl. 204-292.000.
Solomon, Frank: *See—*
Gestaut, Lawrence J.; and Solomon, Frank, 4,337,139, Cl. 204-292.000.
Solomon, Paul W., to Phillips Petroleum Company. Olefin oxidation with supported CuO catalyst. 4,337,364, Cl. 568-475.000.
Solvinto, Jean-Claude: *See—*
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Sondreal, Everett A.: *See—*
Knudson, Curtis L.; Willson, Warrack G.; Baker, Gene G.; Sondreal, Everett A.; and Farnum, Sylvia A., 4,337,142, Cl. 208-8.0LE.
Sone, Masazumi; and Hirota, Yukitsugu, to Nissan Motor Co., Ltd. Plasma jet ignition plug. 4,337,408, Cl. 313-130.000.
Sony Corporation: *See—*
Akagiri, Kenzo, 4,337,445, Cl. 333-14.000.
Noda, Teruyoshi; Ichikawa, Iwao; and Takahashi, Toshio, 4,336,872, Cl. 193-2.00R.
Sorg, Dieter; and Leutwiler, Albert, to Sandoz Ltd. Pyrazinobenzodiazepines. 4,337,198, Cl. 260-243.300.
Sosin, Boleslaw M., to Marconi Company Limited, The. Wide band amplifiers. 4,337,439, Cl. 330-54.000.
Soto, Joseph: *See—*
Bourassin, Lucien; Condat, Bernard; Fortin, Jacques; Leger, Alain; Soto, Joseph; and Solvinto, Jean-Claude, 4,337,480, Cl. 358-93.000.
Sounds Alive Systems, Inc.: *See—*
Pomber, Harry A., 4,336,737, Cl. 84-151.000.
Spahn, Gary L., to Bell Telephone Laboratories, Incorporated. Tamper protection for an automatic remote meter reading unit. 4,337,466, Cl. 340-870.090.
Spars, Byron G.; Tamm, Paul W.; and Wallman, P. Henrik, to Chevron Research Company. Baffle system for staged turbulent bed. 4,337,120, Cl. 196-125.000.
Specht, Viktor: *See—*
Rohlfs, Hans-Adolf; Kling, Alfred; Raab, Guenter; Vogt, Michael; Specht, Viktor; and Schaetzke, Ulrike, 4,337,214, Cl. 260-502.500.
Specktor, Gerald A. Apparatus for repairing and straightening. 4,336,705, Cl. 72-457.000.
Sperry Corporation: *See—*
Cohn, Martin; Jacoby, George V.; and Bates, Charles A., III, 4,337,458, Cl. 340-347.0DD.
Spoor, Wilhelmus J.: *See—*
Van der Geer, Josephus J.; Van Pelt, Willem; Ploeger, Marinus; Spoor, Wilhelmus J.; and Van der Steen, Gerardus H. A. M., 4,337,410, Cl. 313-480.000.
Spotz, Erwin: *See—*
Falkowski, Paul P.; Spotz, Erwin; and Rajadhyaksha, Mangesh, 4,337,219, Cl. 264-130.000.
Spracklen, John E.; and Gerhold, Mark L. C., to Burroughs Corporation. Line driver circuit for a local area contention network. 4,337,465, Cl. 340-825.030.
Sprague, Boyd F. Golf tee holder. 4,336,940, Cl. 273-208.000.
Sprague Electric Company: *See—*
Russell, Philip G.; Bernard, Walter J.; and Ross, Sidney D., 4,337,114, Cl. 156-656.000.
Sprecker, Mark A.; and Hall, John B., to International Flavors & Fragrances Inc. Substituted tricyclodecane derivatives, processes for producing same and organoleptic uses thereof. 4,337,212, Cl. 260-463.000.
Sprecker, Mark A.: *See—*
Kiwala, Jacob; Tokarzewski, Richard J.; Schmitt, Frederick L.; and Sprecker, Mark A., 4,337,180, Cl. 252-522.00R.
Springer, Carl M., to Binks Manufacturing Co. Color change system for spray coating apparatus. 4,337,282, Cl. 427-421.000.
Spruyt, Johannes M. J.: *See—*
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Square D Company: *See—*
Falkowski, Paul P.; Spotz, Erwin; and Rajadhyaksha, Mangesh, 4,337,219, Cl. 264-130.000.
Stachiw, Jerry D.; and Endicott, Donald L., Jr., to United States of America, Navy. Spherical segment inner surface force applicator for laminating non-planar surfaces. 4,337,105, Cl. 156-87.000.
Staiger, Bruno F.; and Stoll, Kurt, to Festo-Maschinenfabrik Gottlieb Stoll. Solenoid valve. 4,336,823, Cl. 137-270.000.
Stanadyne, Inc.: *See—*
Overfield, Norbert W., 4,336,781, Cl. 123-467.000.
Standard Oil Company (Indiana): *See—*
German, Paul M., Jr.; Lamont, James A.; and Gee, John C., 4,337,069, Cl. 55-229.000.

Stanton, Robert P. English unit to metric unit conversion device. 4,336,653, Cl. 33-1.00B.
Starkstrom Gummersbach GmbH: *See—*
Lemmer, Helmut, 4,337,447, Cl. 335-167.000.
Stauffer, Adolf: *See—*
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Stauffer Chemical Company: *See—*
Kuck, Mark A.; and Miller, Gary K., 4,337,125, Cl. 204-59.00R.
Stayner, Robert A., to Chevron Research Company. Borate-containing oil-in-water microemulsion fluid. 4,337,161, Cl. 252-49.500.
Steele, Gerald G.: *See—*
Jorgensen, Richard G.; and Steele, Gerald G., 4,336,820, Cl. 137-100.000.
Stein, Ed. Hickory smoke barbecue oven. 4,336,788, Cl. 126-8.000.
Stein, Jeffrey D. Clip-on electric lock and switching device for telephone. 4,337,381, Cl. 179-178.000.
Steinbeck , Hermann: *See—*
Petzoldt, Karl; Steinbeck , Hermann; and Elger, Walter, 4,337,311, Cl. 435-54.000.
Steineman, Robert J., to United Aircraft Products, Inc. Cartridge valve. 4,336,824, Cl. 137-315.000.
Steiner, Alfred; to Steiner Silidur A.G. Edging for the track inside of a sports installation. 4,336,932, Cl. 272-4.000.
Steiner Silidur A.G.: *See—*
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Steinmetz, Gerhard: *See—*
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Sterling Drug Inc.: *See—*
Lesher, George Y.; and Dickinson, William B., 4,337,253, Cl. 424-250.000.
Schmidt, Paul J.; and Hung, William M., 4,337,340, Cl. 544-350.000.
Sternberg, Moshe M.: *See—*
Hershberger, Donald F.; and Sternberg, Moshe M., 4,337,313, Cl. 435-177.000.
Stetter, Jorg; and Brandes, Wilhelm, to Bayer Aktiengesellschaft. Combating fungi with N-oximinoalkyl-anilides. 4,337,268, Cl. 424-285.000.
Stevens, Myron T., to Outboard Marine Corporation. Idle adjustment control and sculptured twist grip throttle control handle for a marine propulsion device. 4,337,053, Cl. 440-87.000.
Stewart, Roger G., to RCA Corporation. Memory circuit with means for compensating for inversion of stored data. 4,337,522, Cl. 365-190.000.
Stoecklin, Carl E.; and Stoecklin, John F. Construction for whistling and sparkling keel kite. 4,336,915, Cl. 244-153.00R.
Stoecklin, John F.: *See—*
Stoecklin, Carl E.; and Stoecklin, John F., 4,336,915, Cl. 244-153.00R.
Stofko, John J., Jr.: *See—*
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Stokker, Gerald E.: *See—*
Cragoe, Edward J., Jr.; Stokker, Gerald E.; and Gould, Norman P., 4,337,354, Cl. 562-461.000.
Stoll, Kurt: *See—*
Staiger, Bruno F.; and Stoll, Kurt, 4,336,823, Cl. 137-270.000.
Stone, Albert J.; and Nissen, Michael D., to Baxter Travenol Laboratories, Inc. Parenteral solution container for aseptic mixing. 4,336,802, Cl. 128-272.000.
Stoner, Glenn E.; and Cahen, George L., Jr., to Research Corporation. Electrolysis electrode. 4,337,138, Cl. 204-290.00R.
Storandt, Ralf: *See—*
Richert, Manfred; and Storandt, Ralf, 4,336,956, Cl. 280-625.000.
Storni, Angelo: *See—*
Zweifel, Hans; Schilling, Walter; Storni, Angelo; and Bellus, Daniel, 4,337,200, Cl. 548-451.000.
Story, Alfred D.: *See—*
Wilson, Willard T.; Martinek, Harold H.; Martinek, Thomas W.; and Story, Alfred D., 4,336,632, Cl. 17-1.00R.
Stouffer, Ronald D., to Bowles Fluidics Corporation. Oscillating reed and method. 4,336,909, Cl. 239-381.000.
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Foster, Peter D.; and Stowers, Clifford, 4,337,116, Cl. 162-158.000.
Stoy, Vladimir A., to S.K.Y. Polymers, Inc. Novel block copolymers including acrylonitrile sequences and sequences including units derived from glutarimide units and processes for preparing same. 4,337,327, Cl. 525-280.000.
Strempel, Thomas G.: *See—*
Gilligan, Thomas J., III; Strempel, Thomas G.; Dorio, Martin M.; and Babinsky, Andrew D., 4,337,126, Cl. 204-98.000.
Strohl, Niles E.: *See—*
Tuma, Wade B.; and Strohl, Niles E., 4,337,444, Cl. 352-31.00T.
Strydom, Mauritz L., to Tobacco Research and Development Institute Ltd. Drying of tobacco products. 4,336,660, Cl. 34-28.000.
Stuart, Thomas A., to University of Toledo, The. A.C. Motor control circuit. 4,337,429, Cl. 318-811.000.
Stubbs, Richard D.: *See—*
Leigh, Michael L.; and Stubbs, Richard D., 4,336,740, Cl. 89-1.806.
Studhalter, Walter R.: *See—*
Hays, Lance G.; Studhalter, Walter R.; and Ritzi, Emil W., 4,336,693, Cl. 62-116.000.
Suave Shoe Corporation: *See—*
Magnan, Alfredo J., 4,336,761, Cl. 112-121.120.
Sugiura, Shigekata: *See—*
Inoue, Akihiko; and Sugiura, Shigekata, 4,337,382, Cl. 200-5.00E.
Sugiyama, Katsuhiko; Ohsawa, Katsuyuki; Fujikake, Kenji; and Idota, Yoshinori, to Kabushiki Kasiha Toyota Chuo Kenkyusho. Jet control carburetor. 4,336,780, Cl. 123-438.000.
Sullaway, Bob L.; and Treece, Harold O., to Halliburton Company. Inflatable grout seal. 4,337,010, Cl. 405-227.000.
Sumida, Seizo: *See—*
Hashimoto, Shunichi; Oshio, Hiromichi; Mizutani, Masato; Sanemitsu, Yuzuru; Katoh, Haruhiko; and Sumida, Seizo, 4,337,082, Cl. 71-93.000.
Sumita, Tadayuki: *See—*
Ito, Yasuro; Kaga, Hideharu; Yamamoto, Yasuhiro; and Sumita, Tadayuki, 4,337,020, Cl. 425-129.00R.
Sumitomo Chemical Company, Limited: *See—*
Hashimoto, Shunichi; Oshio, Hiromichi; Mizutani, Masato; Sanemitsu, Yuzuru; Katoh, Haruhiko; and Sumida, Seizo, 4,337,082, Cl. 71-93.000.
Kanagawa, Shuichi; Nakao, Shinji; Nakai, Kiyoshi; Kamio, Kunimasa; Matsushima, Shunsuke; Hata, Kazuhiko; and Mashita, Kentaro, 4,337,367, Cl. 568-720.000.
Mukaiyama, Teruaki; Sakito, Yoji; and Asami, Masatoshi, 4,337,346, Cl. 548-324.000.
Shiga, Akinobu; Kakugo, Masahiro; Sadatoshi, Hajime; Wakamatsu, Kazuki; and Yoshioka, Hiroshi, 4,337,326, Cl. 525-244.000.
Takagishi, Hisao; and Kondo, Norio, 4,336,835, Cl. 162-164.300.
Takisawa, Yukihisa; and Hasegawa, Shinichi, 4,337,370, Cl. 568-766.000.
Uematsu, Tamon; Hashimoto, Shunichi; and Oshio, Hiromichi, 4,337,357, Cl. 564-154.000.
Sumitomo Metal Industries, Ltd.: *See—*
Hiroshima, Tatsuo; and Sakamoto, Takahide, 4,337,099, Cl. 148-9.500.
Shiraiwa, Toshio; Hiroshima, Tatsuo; and Sakamoto, Takahide, 4,336,923, Cl. 266-51.000.
Sumitomo Special Metals Co. Ltd.: *See—*
Esashi, Kiyoyuki; and Minatono, Hisae, 4,337,087, Cl. 75-124.000.
Sumitomo, Yuji: *See—*
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Sumiyoshi, Masaharu; Sekiya, Setsuro; Motosugi, Katsuhiko; Takahashi, Hiroshi; and Toyoda, Shuhei, to Toyota Jidosha Kogyo Kabushiki Kaisha. Swirl-inducing apparatus for internal combustion engines. 4,336,776, Cl. 123-306.000.
Sun Electric Corporation: *See—*
Kreft, Keith A., 4,337,515, Cl. 364-551.000.
Suncor Inc.: *See—*
Lauer, James L.; King, Vincent W.; and Lau, Keyser K., 4,337,396, Cl. 250-340.000.
Superior Oil Company, The: *See—*
Haakonsen, Carl; and Thomassen, Thomas, 4,337,128, Cl. 204-107.000.
Sutton Laboratories, Inc.: *See—*
Berke, Philip A.; and Rosen, William E., 4,337,269, Cl. 424-289.000.
Suzuki, Takashi, to Canon Kabushiki Kaisha. Method for optically making a diffusion plate. 4,336,978, Cl. 350-167.000.
Suzuki, Takashi: *See—*
Matsumura, Susumu; and Suzuki, Takashi, 4,336,989, Cl. 354-200.000.
Suzuki, Yasushi; Tsukamoto, Kunio; Minami, Nobuyoshi; Hasegawa, Yukio; Satoh, Michitaka; Yamamoto, Norio; Miyasaka, Katsuhiko; Mikami, Takashi; and Funakoshi, Satoshi, to Teikoku Hormone Manufacturing Co., Ltd. 1-Phenyl isoquinoline-5-acetic acid compounds and analgesic compositions thereof. 4,337,256, Cl. 424-258.000.
Svensson, Goran: *See—*
Schultz, Bengt I.; and Svensson, Goran, 4,336,957, Cl. 280-803.000.
Svoboda, Josef; and Hofbauer, Rupert, to TMC Corporation. Adjusting device for ski bindings. 4,336,654, Cl. 33-3.00A.
Sweat, William T., to ASARCO Incorporated. Non-polluting, cooling method and heat recuperative sintering method. 4,337,083, Cl. 75-5.000.
Sybron Corporation: *See—*
Lipp, Herbert, 4,336,965, Cl. 297-435.000.
Sykes, Larry M.; and Snow, Ray G., to Philip Morris Incorporated. Process for expanding tobacco. 4,336,814, Cl. 131-291.000.
Syndicat des Constructeurs d'Appareils Radio Recepteurs et Televiseurs (SCART): *See—*
Bourassin, Lucien; Condat, Bernard; Fortin, Jacques; Leger, Alain; Soto, Joseph; and Solvinto, Jean-Claude, 4,337,480, Cl. 358-93.000.
Systron Donner Corporation: *See—*
Nickel, Walter; and Tarczy-Hornoch, Zoltan, 4,337,517, Cl. 364-571.000.
Szita, Jeno G., to Arizona Chemical Company. Preparation of hardened tall oil pitch. 4,337,193, Cl. 260-97.500.
Szkrybalo, William, to Hoffmann-La Roche Inc. Plant growth regulants. 4,337,080, Cl. 71-88.000.
Szlucha, Thomas F.; and Eddy, Clifford O., to Xerox Corporation. Apparatus for removing copy sheets from a roll fuser. 4,336,992, Cl. 355-3.0FU.
Tache, Jean-Paul, to Compagnie Lyonnaise de Transmissions Optiques. Method for the serial transmission of binary data and devices for its implementation. 4,337,457, Cl. 340-347.0DD.
Tadokoro, Eiichi: *See—*
Takenaka, Haruo; Tadokoro, Eiichi; and Fujiyama, Masaaki, 4,337,288, Cl. 428-172.000.

Taguchi, Kenichi: *See*—
Ishihara, Toshinobu; Yamamoto, Akira; and Taguchi, Kenichi, 4,337,372, Cl. 568-906.000.
Taira, Eiichi: *See*—
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Taisei Corporation: *See*—
Ito, Yasuro; Kaga, Hideharu; Yamamoto, Yasuhiro; and Sumita, Tadayuki, 4,337,020, Cl. 425-129.00R.
Taiyo Shokai Co., Ltd.: *See*—
Onishi, Masami, 4,336,681, Cl. 53-459.000.
Takagishi, Hisao; and Kondo, Norio, to Sumitomo Chemical Company, Limited. Production of wet-strength paper with aqueous solutions of cationic thermosetting resins. 4,336,835, Cl. 162-164.300.
Takahashi, Hiroshi: *See*—
Sumiyoshi, Masaharu; Sekiya, Setsuro; Motosugi, Katsuhiko; Takahashi, Hiroshi; and Toyoda, Shuhei, 4,336,776, Cl. 123-306.000.
Takahashi, Toshio: *See*—
Arita, Kishio; Murakawa, Kiyoshi; and Takahashi, Toshio, 4,337,089, Cl. 420-472.000.
Noda, Teruyoshi; Ichikawa, Iwao; and Takahashi, Toshio, 4,336,872, Cl. 193-2.00R.
Takahasi, Masauki; Tanaka, Hisami; Yamasawa, Masao; and Ohhata, Michinobu, to Fujitsu Limited. Digital-to-analog converter. 4,337,459, Cl. 340-347.0DA.
Takahasi, Masayosi; Nakazono, Sadatosi; and Nakamura, Yoshio, to Tokai Konetsu Kogyo Co., Ltd. Small ignition device comprising string-like silicon carbide heating element affixed to terminal supports. 4,337,498, Cl. 361-266.000.
Takai, Kazuki, to Clarion Co., Ltd. Magnetic recording/reproducing apparatus. 4,337,487, Cl. 360-71.000.
Takaiwa, Masakazu: *See*—
Yaguchi, Kunihide; Takaiwa, Masakazu; and Aoki, Minoru, 4,337,231, Cl. 423-243.000.
Takamizawa, Minoru; Okada, Fumio; and Aoki, Hisashi, to Shin-Etsu Chemical Company Limited. Benzoin group-containing cyclic organopolysiloxanes and a method for the preparation thereof. 4,337,348, Cl. 556-436.000.
Takano, Rikuo; and Sumitomo, Yuji, to Nippon Telegraph and Telephone Public Corp.; and Sharp Kabushiki Kaisha. Ink liquid supply system for ink jet system printer. 4,337,469, Cl. 346-75.000.
Takara Shuzo Co., Ltd.: *See*—
Fukushima, Susumu; Munenobu, Hideaki; and Yamade, Kazuhiro, 4,337,315, Cl. 435-313.000.
Takeda Chemical Industries, Ltd.: *See*—
Fujino, Masahiko; Wakimasu, Mitsuhiro; and Kawai, Kiyohisa, 4,337,247, Cl. 424-177.000.
Takeda, Toshio: *See*—
Amano, Takehisa; Hamada, Seiya; Isii, Sigeki; and Takeda, Toshio, 4,336,735, Cl. 84-1.170.
Takematsu, Yoshiyuki, to Fuji Koeki Corporation, a part interest. Electric flash apparatus. 4,337,416, Cl. 315-241.00P.
Takenaka, Haruo; Tadokoro, Eiichi; and Fujiyama, Masaaki, to Fuji Photo Film Co., Ltd. Magnetic recording medium. 4,337,288, Cl. 428-172.000.
Takeuchi, Tomio: *See*—
Oki, Toshikazu; Yoshimoto, Akihiro; Kouno, Kageaki; Inui, Taiji; Takeuchi, Tomio; and Umezawa, Hamao, 4,337,312, Cl. 435-78.000.
Takisawa, Yukihisa; and Hasegawa, Shinichi, to Sumitomo Chemical Company, Limited. Process for the preparation of resorcinol derivatives. 4,337,370, Cl. 568-766.000.
Takizawa, Yoshihiro, to Furukawa Denchi Kabushiki Kaisha. Sealing means for terminal section of sealed type storage battery. 4,337,302, Cl. 429-181.000.
Tamm, Paul W.: *See*—
Spars, Byron G.; Tamm, Paul W.; and Wallman, P. Henrik, 4,337,120, Cl. 196-125.000.
Tamura, Yorikazu: *See*—
Sasaki, Hideharu; Tamura, Yorikazu; and Shimada, Keizo, 4,337,155, Cl. 210-500.100.
Tanaka, David T.: *See*—
Anderson, Donald L.; Cherry, Isaac R.; Ripley, John A.; and Tanaka, David T., 4,336,810, Cl. 128-702.000.
Tanaka, Hisami: *See*—
Takahasi, Masauki; Tanaka, Hisami; Yamasawa, Masao; and Ohhata, Michinobu, 4,337,459, Cl. 340-347.0DA.
Tanaka, Junzo; and Kai, Toshio, to Matsushita Electric Industrial Co., Ltd. Cooking appliance of the hot air circulating type. 4,337,384, Cl. 219-10.55B.
Tanaka, Kazuo; and Tsuji, Sadahiko, to Canon Kabushiki Kaisha. Photographic objective stabilized against change of angular field during focusing. 4,336,983, Cl. 350-427.000.
Taneda, Kozo: *See*—
Omi, Yasuo; Wada, Takanori; Sano, Hitoshi; Sato, Shigekatsu; Ido, Kazuo; Taneda, Kozo; and Naka, Junichi, 4,337,021, Cl. 425-142.000.
Tapernoux, Pierre J.: *See*—
McArdle, Beryl L.; and Tapernoux, Pierre J., 4,337,436, Cl. 328-157.000.
Tarczy-Hornoch, Zoltan: *See*—
Nickel, Walter; and Tarczy-Hornoch, Zoltan, 4,337,517, Cl. 364-571.000.
Tashiro, Chiaki; and Horii, Ichiro, to Yoshitomi Pharmaceutical Industries, Ltd. Imidazopyridine-spiro-piperidine compounds. 4,337,260, Cl. 424-267.000.
Taubenmann, Peter; and Korzeczek, Karl-Ludwig, to Krauss-Maffei Aktiengesellschaft. Mold-carrier assembly. 4,337,026, Cl. 425-454.000.
Taylor, Byron K., to RCA Corporation. Flylead for a video disc stylus cartridge. 4,337,536, Cl. 369-126.000.
Taylor, Thomas D.: *See*—
Frantz, Virgil L.; and Taylor, Thomas D., 4,336,821, Cl. 137-187.000.
Teague, John R.; and Huebner, Aronson L., to UOP Inc. Enhanced immobilization of a glucose isomerase. 4,337,172, Cl. 252-430.000.
Teague, Walter D., Jr.; and Sempliner, Arthur T. Power toothbrush or the like with orbital brush action. 4,336,622, Cl. 15-22.00R.
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Rollot, Pierre H.; Cordier, Jean A.; and Briche, Raymond L., 4,336,925, Cl. 266-193.000.
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Teledyne Industries, Inc.: *See*—
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Rorer, David L.; and Hardin, Jasper E., 4,337,301, Cl. 429-179.000.
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Temova Etablissement: *See*—
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Terada, James I. Adjustable lamp. 4,337,506, Cl. 362-142.000.
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Texas Instruments Incorporated: *See*—
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McElroy, David J., 4,336,647, Cl. 29-571.000.
Texon Inc.: *See*—
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Textron, Inc.: *See*—
Wilson, Henry E.; Cronkhite, James D.; and Howard, John V., 4,336,868, Cl. 188-376.000.
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Thermatool Corp.: *See*—
Roberts, Sidney, 4,336,643, Cl. 29-157.30C.
Thingstad, Hans K. Rule or measuring rod. 4,336,655, Cl. 33-161.000.
Thomas, Diethard, to Wilhelm Fette GmbH. Tangential rolling head. 4,336,703, Cl. 72-104.000.
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Thomas, Robert E., to Securax, Inc. Security display rack. 4,336,885, Cl. 211-4.000.
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Thompson, Morice W.: *See*—
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Thomson-Brandt: *See*—
Oprandi, Pierre; and Romeas, Rene, 4,337,532, Cl. 369-45.000.
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Favreau, Michel; Bajon, Jean; Cattoen, Michel; Soca, Serge; Longuet, Maurice; and Delattre, Christian, 4,337,514, Cl. 364-515.000.

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Timken Company, The: *See—*
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Toder, Ellis I. Track switch. 4,336,757, Cl. 104-102.000.
Toft, Leonard L., Jr. Universal time-keeping system and apparatus. 4,337,530, Cl. 368-62.000.
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Tokar, Valery, to Euclid Chemical Company, The. Additive composition for Portland cement materials. 4,337,094, Cl. 106-90.000.
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Tokumasu, Hiroyuki; Uchino, Hideo; and Hozumi, Shiro, to Matsushita Electric Industrial Company, Limited. Method for making a selective absorption film for solar energy. 4,337,097, Cl. 148-6.15R.
Tokyo Kikakikai Co., Ltd.: *See—*
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Tomimoto, Tetsuo; Yasumoto, Yoshio; and Taira, Eiichi, to Matsushita Electric Industrial Co., Ltd. Color resolution compensator. 4,337,479, Cl. 358-37.000.
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Tornstrom, Ingvar. Device for orientation and transportation of elongated objects such as tree plants. 4,336,893, Cl. 221-171.000.
Totty, Ray S.; Love, Gary N.; and Zolot, Jeffrey L., to Packaging Associates, Inc. Product and method of making bellows. 4,336,747, Cl. 92-43.000.
Toyo Engineering Corporation: *See—*
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Toyoda, Shuhei: *See—*
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Tsukiyama, Yoshifumi; Hatanaka, Yasunori; Ogawa, Akiyoshi; and Mizutani, Hitoshi, to Toyota Jidosha Kogyo Kabushiki Kaisha. Tripod type constant velocity universal joint. 4,336,696, Cl. 464-111.000.
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Tu, Hosheng, to UOP Inc. Fluid catalytic cracking process. 4,337,145, Cl. 208-120.000.
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Uematsu, Tamon; Hashimoto, Shunichi; and Oshio, Hiromichi, to Sumitomo Chemical Company, Limited. Herbicidal dithio-bis(-haloacetanilides). 4,337,357, Cl. 564-154.000.
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Umeda, Jun-ichi; Shimada, Toshikazu; Nakamura, Michiharu; Katayama, Yoshifumi; Kajimura, Takashi; and Yamashita, Shigeo, to Hitachi, Ltd. Semiconductor laser device with facet passivation film. 4,337,443, Cl. 372-49.000.
Umezawa, Hamao; Umezawa, Sumio; Fukatsu, Shunzo; Yoneta, Toshio; and Wakazawa, Tadashi, to Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai. Derivative of kanamycin A and a process for the preparation thereof. 4,337,336, Cl. 536-13.800.
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Logsdon, John E.; and Kiff, Ben W., 4,337,356, Cl. 562-549.000.
Robeson, Lloyd M., 4,337,330, Cl. 525-407.000.
Walker, Wellington E., deceased, 4,337,365, Cl. 568-487.000.
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United Aircraft Products, Inc.: *See—*
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van der Heijden, Antonius W. F.; Brambring, Jorg; and Spruyt, Johannes M. J., 4,337,409, Cl. 313-409.000.
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United Technologies Corporation: *See—*
Chaplin, Gary F., 4,336,943, Cl. 277-26.000.
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Axen, Udo F.; and Sih, John C., 4,337,338, Cl. 542-426.000.
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Vacher, Jacques, to Commissariat a l'Energie Atomique. Apparatus for visualizing a body by detecting the radiation of a tracer contained in this body and consisting of positron emitters. 4,337,397, Cl. 250-363.00S.
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van der Heijden, Antonius W. F.; Brambring, Jorg; and Spruyt, Johannes M. J., to U.S. Philips Corporation. Color display tube with control grid positioning feature. 4,337,409, Cl. 313-409.000.
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Vanderpool, Steven H.; and Yeakey, Ernest L., to Texaco Inc. Method of decolorizing mixtures of t-butyl alkylphenols. 4,337,369, Cl. 568-756.000.
Van Der Puy, Michael: *See—*
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Vangen, Robert F., to Control Data Corporation. Time synchronization master station and remote station system. 4,337,463, Cl. 340-825.300.
Van Megen, Everardus A.; Simons, Carel A.; and Moen, Eduard W., to U.S. Philips Corporation. Device for preventing unwanted reflections from an optical system to a laser in an apparatus for optically reading a record carrier. 4,337,535, Cl. 369-121.000.
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van Staden, Renier J., to Lonstein, Charles. Pool toy. 4,336,931, Cl. 272-1.00B.
Varadhachary, Seevaram N., to Congoleum Corporation. Methods for bonding dissimilar synthetic polymeric materials and the products involved in and resulting from such methods. 4,337,296, Cl. 428-420.000.
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Vater, Hans-Joachim; Nickel, Horst; and Henk, Hermann, to Bayer Aktiengesellschaft. Azo dyestuffs. 4,337,195, Cl. 260-146.00T.
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Kahlert, Peter; Dittmann, Norbert; Fink, Heiner; Junker, Frank; Lehmann, Gunter; Schulz, Horst; Johne, Hans; Jentzsch, Arndt; and Kuhnert, Werner, 4,336,969, Cl. 308-61.000.
Veneklasen, Lee H., to Perkin-Elmer Corporation, The. Field emission gun with noise compensation. 4,337,422, Cl. 315-383.000.
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Vesterberg, Olof, to C. Desaga GmbH Nachf. Erich Fecht. Process for electrophoresis. 4,337,131, Cl. 204-180.00G.
Victor United, Inc.: *See—*
Mannon, Walter L.; and Cochran, Cary L., 4,336,786, Cl. 124-23.00R.
Vidalis, Ted. Rug printing system. 4,336,753, Cl. 101-127.000.
Vidra nee Ildiko, Sandor; and Institoris, Laszlo. Cytostatic terminally bifunctional sugar alcohols process for preparing them and pharmaceutical compositions containing them. 4,337,266, Cl. 424-278.000.
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Dalmas, Edward A., 4,337,060, Cl. 8-111.000.
Viola, Michael R. System of making custom transfers. 4,337,293, Cl. 428-337.000.
Vitols, Reinhards; Woodward, Adrian M.; Baker, John E.; and Wray, Gordon R. Method of and mechanism for transferring knitted fabric from a knitting machine to a magazine. 4,336,697, Cl. 66-148.000.
Vogt, B. Richard, to E. R. Squibb & Sons, Inc. Pyrazolo[1,5-c]quinazoline derivatives and related compounds. 4,337,255, Cl. 424-251.000.
Vogt, Michael: *See*—
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von Nostitz, Frauke H. F. Dental arrangement and process for manufacturing dentures. 4,337,042, Cl. 433-171.000.
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Hentschel, Bernhard; Ziebarth, Jurgen; Coenen, Alfred; Kosswig, Kurt; and von Praun, Ferdinand, 4,337,234, Cl. 423-424.000.
von Waclawiczek, Herbert: *See*—
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Votava, Werner F., to Ferro Corporation. Sanitary ware and process of production. 4,337,316, Cl. 501-21.000.
Wacker-Chemie GmbH: *See*—
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Wada, Hiroshi, to Bando Chemical Industries, Ltd. Surface layer structure of an ink transfer device. 4,336,767, Cl. 118-264.000.
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Wagner, Robert L., to Ram Handler, Ltd. Animal sorting gate. 4,336,768, Cl. 119-155.000.
Wagner, William R.; Wright, David E.; and Binsley, Robert L., to Rockwell International Corporation. Direct firing downhole steam generator. 4,336,839, Cl. 166-59.000.
Wahlefeld, August W.: *See*—
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Walz, Alfred. Starter unit for gas discharge lamps powered by alternating-current mains. 4,337,418, Cl. 315-362.000.
Wanner, Karl, to Robert Bosch GmbH. Tool holder for impact device. 4,336,848, Cl. 173-139.000.
Warehime, Norwood R. 3-Way mini-tennis game and apparatus. 4,336,942, Cl. 273-411.000.
Washburn, John R., to Lear Siegler, Inc. Control circuit for accelerometer. 4,336,718, Cl. 73-517.00B.
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Whittaker, Norman; and Caldwell, Albert G., to Burroughs Wellcome Co. Hydantoin derivatives, pharmaceutical compounds and methods of use. 4,337,262, Cl. 424-273.00R.
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Wilkinson, Richard L.; and Winslow, John S., to Discovision Associates. Drive assembly for a video recorder-playback machine. 4,337,538, Cl. 369-223.000.
Willemsen, Herman W., to Northern Telecom Limited. Scanning head for an optical disc system. 4,337,531, Cl. 369-45.000.
Williams, Haydn W. R.: *See*—
Rooney, Clarence S.; Williams, Haydn W. R.; Cragoe, Edward J., Jr.; and Patchett, Arthur A., 4,337,258, Cl. 424-263.000.
Willinger, Karl, to Miba Sintermetall Aktiengesellschaft. Cylindrical turning tool. 4,336,640, Cl. 29-79.000.
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Wisnouskas, Joseph S.; and Moritz, Joseph J., to Hooker Chemicals & Plastics Corp. Purification of thionyl chloride. 4,337,235, Cl. 423-468.000.
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Woo, Ji Y., to Bendix Corporation, The. Drum brake having duo mode. 4,336,867, Cl. 188-326.000.
Wood, Prentice J., to Mead Corporation, The. Article carrier having improved locking means. 4,336,878, Cl. 206-173.000.
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Yaguchi, Kunihide; Takaiwa, Masakazu; and Aoki, Minoru, to Kureha Kagaku Kogyo Kabushiki Kaisha. Removal of sulfur dioxide from exhaust gas. 4,337,231, Cl. 423-243.000.
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Hirano, Takashi, 4,336,853, Cl. 177-25.000.
Yanagihara, Masanobu; Kaneuchi, Yoichiro; and Kobayashi, Shoji, to Nissan Motor Co., Ltd. Intake passage means of an internal combustion engine. 4,336,777, Cl. 123-306.000.
Yang, Lien C. Air purification system using cryogenic techniques. 4,337,071, Cl. 62-37.000.
Yano, Yasuhiro, to Canon Kabushiki Kaisha. Liquid jet recording process. 4,337,467, Cl. 346-1.100.
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Yoshitomi Pharmaceutical Industries, Ltd.: *See*—
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Young, Don H.; and Wellman, Russell W. Water vapor injection system. 4,336,772, Cl. 123-25.00L.
Young, Richard L. Portable game surface for a pool-like game. 4,336,936, Cl. 273-2.000.
Young, Robert G., to Westinghouse Electric Corp. Compact fluorescent lamp having convoluted tubular envelope of tridimensional configuration, method of making such envelope, and lighting unit incorporating such lamp. 4,337,414, Cl. 315-56.000.
Yukimoto, Yoshinori, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor device. 4,337,474, Cl. 357-22.000.
Yusa, Haruhiko; Iizuka, Yo; and Akutsu, Humio, to Kureha Kagaku Kogyo Kabushiki Kaisha. Vinyl chloride resin composition. 4,337,324, Cl. 525-72.000.
Zabotto, Arlette: *See*—
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Zirps, Wilhelm, to Robert Bosch GmbH. Control valve. 4,336,903, Cl. 236-92.00R.
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Zweifel, Hans; Schilling, Walter; Storni, Angelo; and Bellus, Daniel, to Ciba-Geigy Corporation. Tricyclic imidyl derivatives. 4,337,200, Cl. 548-451.000.

# LIST OF REISSUE PATENTEES

TO WHOM

## PATENTS WERE ISSUED ON THE 29TH DAY OF JUNE, 1982

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Aoki, Eiichiro, to Nippon Gakki Seizo Kabushiki Kaisha. Time shared tone keying system in electronic musical instrument. Re. 30,982, Cl. 84-1.190.

Cartaya, Oscar A. Serum-free cell culture media. Re. 30,985, Cl. 435-240.000.

Celotex Corporation, The: *See*—
Hipchen, Donald E.; Skowronski, Michael; and Hagan, Joseph R., Re. 30,984, Cl. 428-297.000.

General Signal Corporation: *See*—
Sibley, Henry C., Re. 30,986, Cl. 235-92.00T.

Gotaverken Aluminum AB: *See*—
Potter, Timothy K.; and Lopez Gomez, Raimundo, Re. 30,980, Cl. 52-479.000.

Hach Chemical Company: *See*—
Stookey, Lawrence L., Re. 30,983, Cl. 23-230.00R.

Hagan, Joseph R.: *See*—
Hipchen, Donald E.; Skowronski, Michael; and Hagan, Joseph R., Re. 30,984, Cl. 428-297.000.

Hipchen, Donald E.; Skowronski, Michael; and Hagan, Joseph R., to Celotex Corporation, The. Structural laminate and method for making same. Re. 30,984, Cl. 428-297.000.

Jones, David G. Omnidirectional clock. Re. 30,987, Cl. 368-76.000.

Kemper, Yves, to Vadetec Corporation. Transmission devices. Re. 30,981, Cl. 74-193.000.

Lopez Gomez, Raimundo: *See*—
Potter, Timothy K.; and Lopez Gomez, Raimundo, Re. 30,980, Cl. 52-479.000.

Nippon Gakki Seizo Kabushiki Kaisha: *See*—
Aoki, Eiichiro, Re. 30,982, Cl. 84-1.190.

Potter, Timothy K.; and Lopez Gomez, Raimundo, to Gotaverken Aluminum AB. Wall system. Re. 30,980, Cl. 52-479.000.

Sibley, Henry C., to General Signal Corporation. Vital relay driver having controlled response time. Re. 30,986, Cl. 235-92.00T.

Skowronski, Michael: *See*—
Hipchen, Donald E.; Skowronski, Michael; and Hagan, Joseph R., Re. 30,984, Cl. 428-297.000.

Stookey, Lawrence L., to Hach Chemical Company. Colorimetric determination of iron. Re. 30,983, Cl. 23-230.00R.

Vadetec Corporation: *See*—
Kemper, Yves, Re. 30,981, Cl. 74-193.000.

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# LIST OF DESIGN PATENTEES

Acme Engineering & Manufacturing Corporation: *See*—
Bohanon, Hoy R., Sr., 265,190, Cl. D13-12.000.
Bohanon, Hoy R., Sr., 265,191, Cl. D13-12.000.

Aiello, Francois. Slide calculator for metal beam dimensions. 265,209, 6-29-82, Cl. D18-9.000.

Amarger, Guy, to Compagnie Generale des Etablissements Michelin. Tire. 265,183, 6-29-82, Cl. D12-143.000.

Anderson, Jesse C. Stove. 265,238, 6-29-82, Cl. D23-97.000.

Bales, Emmett R., to Metals Engineering Corporation. Barbeque grill. 265,162, 6-29-82, Cl. D7-110.000.

Barberry, Susan J.: *See*—
Barberry, Theodore O., Jr.; and Barberry, Susan J., 265,253, Cl. D27-06.000.

Barberry, Theodore O., Jr.; and Barberry, Susan J. Pipe stand. 265,253, 6-29-82, Cl. D27-06.000.

Baro Far East Limited: *See*—
Fung, Pak T., 265,193, Cl. D14-5.000.

Beck, Donald; Johnson, Hugh N.; and Jones, Haydn, to M.G.F. Distributors Ltd. Fireplace insert. 265,237, 6-29-82, Cl. D23-94.000.

Benedict, Maxwell E. Plant pot stand. 265,150, 6-29-82, Cl. D6-28.000.

Bern, Stephen C.: *See*—
McNaughton, David S.; Bern, Stephen C.; Cummings, Kenneth W.; and Perethian, Charles M., 265,252, Cl. D26-139.000.

Bisk, Leonard; and Rogahn, Gunther, to Independent Products Company, Inc. Hanger. 265,156, 6-29-82, Cl. D6-253.000.

Bluestein, Bernard B.: *See*—
Ernest, Robert O.; and Bluestein, Bernard B., 265,164, Cl. D7-153.000.
Ernest, Robert O.; and Bluestein, Bernard B., 265,166, Cl. D7-159.000.

Bock, Erik, to Superfos Emballage A/S. Packing drum. 265,176, 6-29-82, Cl. D9-352.000.

Bohanon, Hoy R., Sr., to Acme Engineering & Manufacturing Corporation. Control unit. 265,190, 6-29-82, Cl. D13-12.000.

Bohanon, Hoy R., Sr., to Acme Engineering & Manufacturing Corporation. Control unit. 265,191, 6-29-82, Cl. D13-12.000.

Bollen, Roger J.; Erdos, William A.; and Ramsey, Roger H., to Eagle Rubber Co., Inc. Spring mounted riding toy. 265,223, 6-29-82, Cl. D21-247.000.

Bollen, Roger J.; Erdos, William A.; and Ramsey, Roger H., to Eagle Rubber Co., Inc. Spring mounted riding toy. 265,224, 6-29-82, Cl. D21-247.000.

Boodjie Enterprises Ltd.: *See*—
Craig, Ronald; and Craig, Susan, 265,217, Cl. D21-35.000.

Boyle, Raymond J. Eyeglass temple screw or the like. 265,174, 6-29-82, Cl. D8-387.000.

Bravo, Anthony L., to Zeno Table Co., Inc. Combined dresser and mirror unit. 265,155, 6-29-82, Cl. D6-154.000.

Brite Way Corporation: *See*—
Salem, Henry A., 265,201, Cl. D32-2.000.

Brooks, Kenneth. Rope shackle. 265,173, 6-29-82, Cl. D8-356.000.

Bruno, Jenna; and Vance, Georgia. Toy holder for use in bathtubs, showers or the like. 265,152, 6-29-82, Cl. D6-86.000.

Bucchianeri, Richard M.: *See*—
Manno, Joseph J.; Busche, William W.; Bucchianeri, Richard M.; and Kreinick, Stephen J., 265,243, Cl. D24-8.000.

Bunger, Richard E.; and Hancock, Roy J., to Corral Industries, Inc. Curb for animal confinement pens. 265,256, 6-29-82, Cl. D30-2.000.

Bunger, Richard E.; and Hancock, Roy J., to Corral Industries, Inc. Interlocking flume platform panel for animal confinement pens. 265,257, 6-29-82, Cl. D30-2.000.

Bunger, Richard E.; and Hancock, Roy J., to Corral Industries, Inc. Cattle feed bunker. 265,258, 6-29-82, Cl. D30-13.000.

Bunger, Richard E.; and Hancock, Roy J., to Corral Industries, Inc. Cattle feed bunker. 265,259, 6-29-82, Cl. D30-13.000.

Bunger, Richard E.; and Hancock, Roy J., to Corral Industries, Inc. Cattle feed bunker. 265,260, 6-29-82, Cl. D30-13.000.

Bunnell, Donald E.; and Kintzi, Eldor A. Snow removal tool. 265,169, 6-29-82, Cl. D8-10.000.

Burroughs Corporation: *See*—
Pedersen, John H.; Stencel, John, Jr.; Reaume, Richard W.; Rourke, Robert T.; Tranquilla, Michael N.; and Saunders, Michael A., 265,200, Cl. D14-103.000.

Busche, William W.: *See*—
Manno, Joseph J.; Busche, William W.; Bucchianeri, Richard M.; and Kreinick, Stephen J., 265,243, Cl. D24-8.000.

C. Josef Lamy GmbH: *See*—
Spiegel, Bernt, 265,212, Cl. D19-47.000.

Carl Zeiss-Stiftung: *See*—
Weber, Klaus; and Stutz, Erich, 265,206, Cl. D16-131.000.

Carlat, J. Keith; and Cliff, John O., to Pittsburgh-Des Moines Corporation. Combined water storage tank and building. 265,226, 6-29-82, Cl. D23-2.000.

Clairol Incorporated: *See*—
MacGregor, Francis W., 265,247, Cl. D24-41.000.

Cliff, John O.: *See*—
Carlat, J. Keith; and Cliff, John O., 265,226, Cl. D23-2.000.

Coca-Cola Company: *See*—
La Barbera, Mannie, 265,159, Cl. D7-70.000.

Collins, Charles K.: *See*—
Rake, Lance G.; and Collins, Charles K., 265,146, Cl. D3-30.100.

Compagnie Generale des Etablissements Michelin: *See*—
Amarger, Guy, 265,183, Cl. D12-143.000.
Raluy, Antoine, 265,187, Cl. D12-149.000.
Cordova, Adolph. Combined grate and water heater insert for wood burning fireplace. 265,167, 6-29-82, Cl. D7-207.000.
Corral Industries, Inc.: *See*—
Bunger, Richard E.; and Hancock, Roy J., 265,256, Cl. D30-2.000.
Bunger, Richard E.; and Hancock, Roy J., 265,257, Cl. D30-2.000.
Bunger, Richard E.; and Hancock, Roy J., 265,258, Cl. D30-13.000.
Bunger, Richard E.; and Hancock, Roy J., 265,259, Cl. D30-13.000.
Bunger, Richard E.; and Hancock, Roy J., 265,260, Cl. D30-13.000.
Cox, Richard D., to Nautical Engineering Division of R & D Enterprises. Portable tray table for use primarily on a boat. 265,154, 6-29-82, Cl. D6-138.000.
Craig, Ronald; and Craig, Susan, to Boodjie Enterprises Ltd. Game board. 265,217, 6-29-82, Cl. D21-35.000.
Craig, Susan: *See*—
Craig, Ronald; and Craig, Susan, 265,217, Cl. D21-35.000.
Crawford, Ted G.; Johnson, Allan B.; and Mackay, Spencer L., to Teledyne Industries, Inc. Motor housing for an oral hygiene appliance. 265,245, 6-29-82, Cl. D24-15.000.
Cummings, Kenneth W.: *See*—
McNaughton, David S.; Bern, Stephen C.; Cummings, Kenneth W.; and Perethian, Charles M., 265,252, Cl. D26-139.000.
Darby, David L.: *See*—
Darby, James W.; and Darby, David L., 265,251, Cl. D25-64.000.
Darby, James W.; and Darby, David L. Swimming pool ladder. 265,251, 6-29-82, Cl. D25-64.000.
Dwyhalo, Ronald W. Rotatable cassette tape storage unit. 265,148, 6-29-82, Cl. D3-35.000.
Dynabrade, Inc.: *See*—
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Eagle Rubber Co., Inc.: *See*—
Bollen, Roger J.; Erdos, William A.; and Ramsey, Roger H., 265,223, Cl. D21-247.000.
Bollen, Roger J.; Erdos, William A.; and Ramsey, Roger H., 265,224, Cl. D21-247.000.
Energetics Mfg. Co.: *See*—
Kooles, Charles W., 265,240, Cl. D23-97.000.
Erdos, William A.: *See*—
Bollen, Roger J.; Erdos, William A.; and Ramsey, Roger H., 265,223, Cl. D21-247.000.
Bollen, Roger J.; Erdos, William A.; and Ramsey, Roger H., 265,224, Cl. D21-247.000.
Eriksson, Sven G.; and Morwing, Bo A., to Telefonaktiebolaget L M Ericsson. Code plug for a railway signal beacon. 265,189, 6-29-82, Cl. D13-12.000.
Ernest, Robert O.; and Bluestein, Bernard B., to Sunbeam Corporation. Appliance-driving unit for a food-processing appliance. 265,164, 6-29-82, Cl. D7-153.000.
Ernest, Robert O.; and Thomas, Richard K., to Sunbeam Corporation. Food processor base. 265,165, 6-29-82, Cl. D7-153.000.
Ernest, Robert O.; and Bluestein, Bernard B., to Sunbeam Corporation. Food-mixing apparatus. 265,166, 6-29-82, Cl. D7-159.000.
Faranda, Robert T.; and Leer, Stuart D., to Litton Business Systems, Inc. Calculator. 265,208, 6-29-82, Cl. D18-7.000.
First Champaign Corporation: *See*—
McNaughton, David S.; Bern, Stephen C.; Cummings, Kenneth W.; and Perethian, Charles M., 265,252, Cl. D26-139.000.
Fleckenstein, Elwin H.; and Welsch, Walter N., to Dynabrade, Inc. Casing for a portable belt grinder. 265,172, 6-29-82, Cl. D8-62.000.
Fox, Joseph H. Electrical golf bag carrier. 265,263, 6-29-82, Cl. D34-15.000.
Fung, Pak T., to Baro Far East Limited. Combined clock radio and cassette player. 265,193, 6-29-82, Cl. D14-5.000.
Gerber, William C., to Rubbermaid Incorporated. Clothes hamper. 265,261, 6-29-82, Cl. D32-37.000.
Gillette Company, The: *See*—
Rams, Dieter, 265,254, Cl. D27-42.000.
Giroflex-Entwicklungs AG: *See*—
Roner, Ludwig, 265,151, Cl. D6-78.000.
Gislaved Aktiebolag: *See*—
Grohmann, Hubert; Holmen, Kent-Ove; and Nilsson, Halvard, 265,185, Cl. D12-146.000.
Goodyear Tire & Rubber Company, The: *See*—
Hammond, Philip S., 265,184, Cl. D12-143.000.
Karlyn, Warren T.; and Lindner, Daniel J., 265,186, Cl. D12-147.000.
Gorman, Jeffrey B. Cat biscuit. 265,140, 6-29-82, Cl. D1-27.000.
Grant, Perry J.: *See*—
Israel, Leonard H.; and Grant, Perry J., 265,214, Cl. D21-17.000.
Green, Allen H., II. Spaghetti portion measurer. 265,158, 6-29-82, Cl. D7-50.000.
Grigorieff, Paul P. Post operative knee orthosis. 265,248, 6-29-82, Cl. D24-49.000.
Grohmann, Hubert; Holmen, Kent-Ove; and Nilsson, Halvard, to Gislaved Aktiebolag. Vehicle tire. 265,185, 6-29-82, Cl. D12-146.000.
Halvorsen, Kenneth, to Medical Testing Systems, Inc. Fitting assembly for guiding and restraining a probe in a catheter. 265,249, 6-29-82, Cl. 24-54.000.
Hammond, Philip S., to Goodyear Tire & Rubber Company, The. Tire. 265,184, 6-29-82, Cl. D12-143.000.
Hancock, Roy J.: *See*—
Bunger, Richard E.; and Hancock, Roy J., 265,256, Cl. D30-2.000.
Bunger, Richard E.; and Hancock, Roy J., 265,257, Cl. D30-2.000.
Bunger, Richard E.; and Hancock, Roy J., 265,258, Cl. D30-13.000.
Bunger, Richard E.; and Hancock, Roy J., 265,259, Cl. D30-13.000.
Bunger, Richard E.; and Hancock, Roy J., 265,260, Cl. D30-13.000.
Hardin, Charles H., to Kusan, Inc. Toy gun. 265,221, 6-29-82, Cl. D21-147.000.
Hitaishi, Etsuo; and Shohoji, Takeshi, to Ryobi, Ltd. Printing machine. 265,210, 6-29-82, Cl. D18-13.000.
Holmen, Kent-Ove: *See*—
Grohmann, Hubert; Holmen, Kent-Ove; and Nilsson, Halvard, 265,185, Cl. D12-146.000.
Independent Products Company, Inc.: *See*—
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International Jensen Incorporated: *See*—
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Urban, Keith F.; and Matsuda, Hari, 265,199, Cl. D14-96.000.
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Stern, Harold; and White, William, 265,142, Cl. D2-24.000.
Taniyama, Toshiko, 265,143, Cl. D2-24.000.
Israel, Leonard H.; and Grant, Perry J. Game board. 265,214, 6-29-82, Cl. D21-17.000.
IVAC Corporation: *See*—
Manno, Joseph J.; Busche, William W.; Bucchianeri, Richard M.; and Kreinick, Stephen J., 265,243, Cl. D24-8.000.
Jackson, Dennis B., to Wiltshire Consolidated Limited. Scissor scabbard. 265,147, 6-29-82, Cl. D3-30.100.
Jenkins, James H. Flush valve closer. 265,228, 6-29-82, Cl. D23-19.000.
Jermyn, Arthur C., to Young Dental Mfg. Co., Inc. Denture retainer implant. 265,246, 6-29-82, Cl. D24-33.000.
John H. Sparks Property Services, Inc.: *See*—
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John J. Madison Company, Inc.: *See*—
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Johnson, Hugh N.: *See*—
Beck, Donald; Johnson, Hugh N.; and Jones, Haydn, 265,237, Cl. D23-94.000.
Jolley, F. Carlton. Water purification unit. 265,227, 6-29-82, Cl. D23-3.000.
Jones, Clifford R. Telephone. 265,197, 6-29-82, Cl. D14-53.000.
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Karlyn, Warren T.; and Lindner, Daniel J., to Goodyear Tire & Rubber Company, The. Tire. 265,186, 6-29-82, Cl. D12-147.000.
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Kassai, Kenzou, 265,219, Cl. D21-78.000.
Kassai, Kenzou, to Kassai Kabushikikaisha. Toy vehicle. 265,219, 6-29-82, Cl. D21-78.000.
Kay, Ronald D., to John H. Sparks Property Services, Inc. Noise maker attachment for roller skates. 265,222, 6-29-82, Cl. D21-226.000.
Keller, Ernest. Combined water closet and lavatory. 265,235, 6-29-82, Cl. D23-49.000.
Kelley, Craig B., to SCM Corporation. Toaster. 265,160, 6-29-82, Cl. D7-93.000.
Kelsey-Hayes Co.: *See*—
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Kido, Katsutoshi; and Usami, Satoru, to Matsushita Electric Industrial Co., Ltd. Combined radio receiver and tape recorder. 265,194, 6-29-82, Cl. D14-5.000.
Kintzi, Eldor A.: *See*—
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Knight, Joseph L. Scribing rule guide or similar article. 265,211, 6-29-82, Cl. D19-35.000.
Kooles, Charles W., to Energetics Mfg. Co. Stove. 265,240, 6-29-82, Cl. D23-97.000.
Korte, Richard L.: *See*—
Rosenfield, George; and Korte, Richard L., 265,207, Cl. D16-133.000.
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Kusan, Inc.: *See*—
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La Barbera, Mannie, to Coca-Cola Company. Combined bottle handle and holder. 265,159, 6-29-82, Cl. D7-70.000.
Laurenzi, Richard F. Design for a hanging shelf. 265,153, 6-29-82, Cl. D6-113.000.
Leer, Stuart D.: *See*—
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Lents, Charles M., to Stainless Ice-Tainer Company. Sanitary machine for storing and dispensing particulate ice. 265,203, 6-29-82, Cl. D15-80.000.
Lilly, Wilbur E. Stove. 265,239, 6-29-82, Cl. D23-97.000.
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Lloyd, Edward A. Strap fastener for ski equipment or similar article. 265,175, 6-29-82, Cl. D8-394.000.

M.G.F. Distributors Ltd.: *See—*
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Manno, Joseph J.; Busche, William W.; Bucchianeri, Richard M.; and Kreinick, Stephen J., to IVAC Corporation. Fluid delivery apparatus. 265,243, 6-29-82, Cl. D24-8.000.

Matsuda, Hari, to International Jensen Incorporated. Electronic power amplifier. 265,198, 6-29-82, Cl. D14-96.000.

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McKeegan, Sharon K. A. Soup bowl. 265,157, 6-29-82, Cl. D7-20.000.

McNaughton, David S.; Bern, Stephen C.; Cummings, Kenneth W.; and Perethian, Charles M., to First Champaign Corporation. Headlight bezel for motorcycle fairing. 265,252, 6-29-82, Cl. D26-139.000.

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Metals Engineering Corporation: *See—*
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Morwing, Bo A.: *See—*
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Munson, Beauford E. Drill bit. 265,205, 6-29-82, Cl. D15-139.000.

Musillo, Robert G. Pendant setting for gems. 265,178, 6-29-82, Cl. D11-91.000.

Musillo, Robert G. Pendant setting for gems. 265,179, 6-29-82, Cl. D11-91.000.

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Noeth, Peter E., Jr. Reset button extender for computers or the like. 265,192, 6-29-82, Cl. D13-38.000.

Nordivan Engineering Aps: *See—*
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Oakes, Harry S. Fly swatter. 265,225, 6-29-82, Cl. D22-20.000.

O'Neil, LaVerta M. Lotion applicator. 265,255, 6-29-82, Cl. D28-7.000.

Orenstein, Henry. Toy garage. 265,220, 6-29-82, Cl. D21-118.000.

Ornatek, Larry B. Pennant. 265,181, 6-29-82, Cl. D11-166.000.

Ornatek, Larry B. Pennant. 265,182, 6-29-82, Cl. D11-166.000.

Otake, Toshio, to Yoshikawa Metal Ware Kabushiki Kaisha. Covered cooking pot or similar article. 265,161, 6-29-82, Cl. D7-97.000.

Patterson, Donald R. Examining table. 265,241, 6-29-82, Cl. D24-03.000.

Patterson, Donald R. Examining table. 265,242, 6-29-82, Cl. D24-03.000.

Paul Associates, Inc.: *See—*
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Paul, Stanley M., 265,230, Cl. D23-25.000.
Paul, Stanley M., 265,231, Cl. D23-25.000.

Paul, Stanley M., to Paul Associates, Inc. Faucet set. 265,229, 6-29-82, Cl. D23-25.000.

Paul, Stanley M., to Paul Associates, Inc. Faucet set. 265,230, 6-29-82, Cl. D23-25.000.

Paul, Stanley M., to Paul Associates, Inc. Faucet set. 265,231, 6-29-82, Cl. D23-25.000.

Pedersen, John H.; Stencel, John, Jr.; Reaume, Richard W.; Rourke, Robert T.; Tranquilla, Michael N.; and Saunders, Michael A., to Burroughs Corporation. Computer console. 265,200, 6-29-82, Cl. D14-103.000.

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Rake, Lance G.; and Collins, Charles K. Cover for a musical instrument case. 265,146, 6-29-82, Cl. D3-30.100.

Raluy, Antoine, to Compagnie Generale des Etablissements Michelin. Tire. 265,187, 6-29-82, Cl. D12-149.000.

Rams, Dieter, to Gillette Company, The. Cigarette lighter. 265,254, 6-29-82, Cl. D27-42.000.

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Bollen, Roger J.; Erdos, William A.; and Ramsey, Roger H., 265,223, Cl. D21-247.000.
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Reid, Donald J., to Kelsey-Hayes Co. Vehicle wheel. 265,188, 6-29-82, Cl. D12-211.000.

Robinett, Donald C. Rocking toy. 265,218, 6-29-82, Cl. D21-66.000.

Rogahn, Gunther: *See—*
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Romano, Mary A. Hand bag insert. 265,149, 6-29-82, Cl. D3-54.000.

Roner, Ludwig, to Giroflex-Entwicklungs AG. Chair or similar article. 265,151, 6-29-82, Cl. D6-78.000.

Ronvik, John P., to Sears, Roebuck and Co. Lens for faucet handle and the like. 265,232, 6-29-82, Cl. D23-28.000.

Ronvik, John P., to Sears, Roebuck and Co. Faucet handle and the like. 265,233, 6-29-82, Cl. D23-28.000.

Ronvik, John P., to Sears, Roebuck and Co. Faucet handle and the like. 265,234, 6-29-82, Cl. D23-29.000.

Rosen, Jacob. Gameboard. 265,215, 6-29-82, Cl. D21-34.000.

Rosenfield, George; and Korte, Richard L., to Tasco Sales, Inc. Pair of binoculars or similar article. 265,207, 6-29-82, Cl. D16-133.000.

Rourke, Robert T.: *See—*
Pedersen, John H.; Stencel, John, Jr.; Reaume, Richard W.; Rourke, Robert T.; Tranquilla, Michael N.; and Saunders, Michael A., 265,200, Cl. D14-103.000.

Rubbermaid Incorporated: *See—*
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Ryder, Francis E., to Ryder International Corporation. Contact lens sterilizer unit casing. 265,244, 6-29-82, Cl. D24-9.000.

Ryder International Corporation: *See—*
Ryder, Francis E., 265,244, Cl. D24-9.000.

Ryobi, Ltd.: *See—*
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Salem, Henry A., to Brite Way Corporation. Glasswasher. 265,201, 6-29-82, Cl. D32-2.000.

Santa-Eulalia Carvajales, Javier B.: *See—*
Santa-Eulalia Carvajales, Jesus A.; and Santa-Eulalia Carvajales, Javier B., 265,180, Cl. D11-158.000.

Santa-Eulalia Carvajales, Jesus A.; and Santa-Eulalia Carvajales, Javier B., to John J. Madison Company, Inc. Figurine of a German shepherd pup. 265,180, 6-29-82, Cl. D11-158.000.

Saunders, Michael A.: *See—*
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Ronvik, John P., 265,232, Cl. D23-28.000.
Ronvik, John P., 265,233, Cl. D23-28.000.
Ronvik, John P., 265,234, Cl. D23-29.000.

Sharp Corporation: *See—*
Matsumura, Katsuya, 265,196, Cl. D14-14.000.

Shohoji, Takeshi: *See—*
Hitaishi, Etsuo; and Shohoji, Takeshi, 265,210, Cl. D18-13.000.

Skinner, Harold E. Aid for the addition of columnar arranged driving hours. 265,177, 6-29-82, Cl. D10-64.000.

Slingerland, Willem A., to U.S. Philips Corporation. Magnetic tape cassette. 265,195, 6-29-82, Cl. D14-11.000.

Societe Technisynthese (S.A.R.L.): *See—*
Vermonet, Christian, 265,144, Cl. D2-309.000.

Spalding, Michael A. Table bat and ball game device. 265,213, 6-29-82, Cl. D21-14.000.

Spiegel, Bernt, to C. Josef Lamy GmbH. Ballpoint pen. 265,212, 6-29-82, Cl. D19-47.000.

Stainless Ice-Tainer Company: *See—*
Lents, Charles M., 265,203, Cl. D15-80.000.

Steiner, Fred S. Peeler. 265,163, 6-29-82, Cl. D7-147.000.

Stencel, John, Jr.: *See—*
Pedersen, John H.; Stencel, John, Jr.; Reaume, Richard W.; Rourke, Robert T.; Tranquilla, Michael N.; and Saunders, Michael A., 265,200, Cl. D14-103.000.

Stern, Harold; and White, William, to International Playtex, Inc. Brassiere. 265,141, 6-29-82, Cl. D2-24.000.

Stern, Harold; and White, William, to International Playtex, Inc. Brassiere. 265,142, 6-29-82, Cl. D2-24.000.

Stutz, Erich: *See—*
Weber, Klaus; and Stutz, Erich, 265,206, Cl. D16-131.000.

Sunbeam Corporation: *See—*
Ernest, Robert O.; and Bluestein, Bernard B., 265,164, Cl. D7-153.000.
Ernest, Robert O.; and Thomas, Richard K., 265,165, Cl. D7-153.000.
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Superfos Emballage A/S: *See—*
Bock, Erik, 265,176, Cl. D9-352.000.

Tammen, Bobby J. Game board. 265,216, 6-29-82, Cl. D21-34.000.

Taniyama, Toshiko, to International Playtex, Inc. Brassiere. 265,143, 6-29-82, Cl. D2-24.000.

Tasco Sales, Inc.: *See—*
Rosenfield, George; and Korte, Richard L., 265,207, Cl. D16-133.000.

Taylor, William D., to Rubbermaid Incorporated. Molded plastic dish drainer. 265,262, 6-29-82, Cl. D32-55.000.
Teledyne Industries, Inc.: *See*—
Crawford, Ted G.; Johnson, Allan B.; and Mackay, Spencer L., 265,245, Cl. D24-15.000.
Telefonaktiebolaget L M Ericsson: *See*—
Eriksson, Sven G.; and Morwing, Bo A., 265,189, Cl. D13-12.000.
Thomas, Richard K.: *See*—
Ernest, Robert O.; and Thomas, Richard K., 265,165, Cl. D7-153.000.
Thomsen, Flemming J., to Nordivan Engineering Aps. Rotary refrigerator for the cooling of fodder pills made by a pill press. 265,202, 6-29-82, Cl. D15-79.000.
Tranquilla, Michael N.: *See*—
Pedersen, John H.; Stencel, John, Jr.; Reaume, Richard W.; Rourke, Robert T.; Tranquilla, Michael N.; and Saunders, Michael A., 265,200, Cl. D14-103.000.
Turchan, Inc.: *See*—
Turchan, Manuel C.; and Mackie, Harry D., 265,204, Cl. D15-130.000.
Turchan, Manuel C.; and Mackie, Harry D., to Turchan, Inc. Numerically controlled lathe. 265,204, 6-29-82, Cl. D15-130.000.
U.S. Philips Corporation: *See*—
Slingerland, Willem A., 265,195, Cl. D14-11.000.
Urban, Keith F.; and Matsuda, Hari, to International Jensen Incorporated. Electronic graphic equalizer or the like. 265,199, 6-29-82, Cl. D14-96.000.
Usami, Satoru: *See*—
Kido, Katsutoshi; and Usami, Satoru, 265,194, Cl. D14-5.000.
Vance, Georgia: *See*—
Bruno, Jenna; and Vance, Georgia, 265,152, Cl. D6-86.000.
Vermonet, Christian, to Societe Technisynthese (S.A.R.L.). Shoe. 265,144, 6-29-82, Cl. D2-309.000.
Wallin, Ronald C.; and Wallin, Wesley A. Stair for a swimming pool. 265,250, 6-29-82, Cl. D25-63.000.
Wallin, Wesley A.: *See*—
Wallin, Ronald C.; and Wallin, Wesley A., 265,250, Cl. D25-63.000.
Weber, Klaus; and Stutz, Erich, to Carl Zeiss-Stiftung. Compact microscope. 265,206, 6-29-82, Cl. D16-131.000.
Welsch, Walter N.: *See*—
Fleckenstein, Elwin H.; and Welsch, Walter N., 265,172, Cl. D8-62.000.
White, William: *See*—
Stern, Harold; and White, William, 265,141, Cl. D2-24.000.
Stern, Harold; and White, William, 265,142, Cl. D2-24.000.
Wiltshire Consolidated Limited: *See*—
Jackson, Dennis B., 265,147, Cl. D3-30.100.
Yamin, Amilcar F., to Produtos Eletricos Corona Ltda. Electric water heater. 265,236, 6-29-82, Cl. D23-88.000.
Yeh, Chan-Jong. Mailbox. 265,264, 6-29-82, Cl. D99-33.000.
Yoshikawa Metal Ware Kabushiki Kaisha: *See*—
Otake, Toshio, 265,161, Cl. D7-97.000.
Young Dental Mfg. Co., Inc.: *See*—
Jermyn, Arthur C., 265,246, Cl. D24-33.000.
Zabarte, Ron. Combination cutter and cultivator tool head. 265,168, 6-29-82, Cl. D8-06.000.
Zeno Table Co., Inc.: *See*—
Bravo, Anthony L., 265,155, Cl. D6-154.000.
Zukaitis, Robert C. Heavy duty line tightener. 265,170, 6-29-82, Cl. D8-44.000.
Zukaitis, Robert C. Line tightener. 265,171, 6-29-82, Cl. D8-44.000.

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Brooks, Donald R., executor: *See*—
Davis, Luther D., deceased; and Brooks, Donald R., executor, 4,861, Cl. 43.000.
Davis, Luther D., deceased; and by Brooks, Donald R., executor, to University of California, The Regents of the. Peach tree (7-7-52). 4,861, 6-29-82, Cl. 43.000.
Ryan, John J. Impatiens plant named Pomo. 4,862, 6-29-82, Cl. 68.000.
University of California, The Regents of the: *See*—
Davis, Luther D., deceased; and Brooks, Donald R., executor, 4,861, Cl. 43.000.

# CLASSIFICATION OF PATENTS

## ISSUED JUNE 29, 1982

NOTE.—First number, class; second number, subclass; third number, patent number

**CLASS 3**

| | |
|---|---|
| 1.9 | 4,336,617 |
| 1.913 | 4,336,618 |

**CLASS 4**

| | |
|---|---|
| 619 | 4,336,619 |
| 639 | 4,336,620 |

**CLASS 5**

| | |
|---|---|
| 446 | 4,336,621 |

**CLASS 8**

| | |
|---|---|
| 111 | 4,337,060 |
| 405 | 4,337,061 |
| 557 | 4,337,062 |

**CLASS 13**

| | |
|---|---|
| 23 | 4,337,373 |

**CLASS 15**

| | |
|---|---|
| 22 R | 4,336,622 |
| 222 | 4,336,623 |
| 245 | 4,336,624 |
| 250.42 | 4,336,625 |
| 319 | 4,336,626 |
| 321 | 4,336,627 |
| 415 R | 4,336,628 |

**CLASS 16**

| | |
|---|---|
| 35 R | 4,336,629 |
| | 4,336,630 |
| 126 | 4,336,631 |

**CLASS 17**

| | |
|---|---|
| 1 R | 4,336,632 |
| 51 | 4,336,633 |
| 57 | 4,336,634 |

**CLASS 23**

| | |
|---|---|
| 230 B | 4,337,063 |
| | 4,337,064 |
| | 4,337,065 |
| 230 R | Re.30,983 |

**CLASS 24**

| | |
|---|---|
| 72.5 | 4,336,635 |
| 115 M | 4,336,636 |
| 249 DP | 4,336,637 |

**CLASS 26**

| | |
|---|---|
| 99 | 4,336,638 |

**CLASS 29**

| | |
|---|---|
| 25.35 | 4,336,639 |
| 79 | 4,336,640 |
| 148.4 A | 4,336,641 |
| 157.3 A | 4,336,642 |
| 157.3 C | 4,336,643 |
| 401.1 | 4,336,644 |
| 510 | 4,336,645 |
| 564.2 | 4,336,646 |
| 571 | 4,336,647 |
| 572 | 4,336,648 |
| 598 | 4,336,649 |

**CLASS 30**

| | |
|---|---|
| 34.2 | 4,336,650 |
| 49 | 4,336,651 |
| 258 | 4,336,652 |

**CLASS 33**

| | |
|---|---|
| 1 B | 4,336,653 |
| 3 A | 4,336,654 |
| 161 | 4,336,655 |
| 174 E | 4,336,656 |
| 174 L | 4,336,657 |
| 288 | 4,336,658 |
| 395 | 4,336,659 |

**CLASS 34**

| | |
|---|---|
| 28 | 4,336,660 |

**CLASS 36**

| | |
|---|---|
| 44 | 4,336,661 |

**CLASS 37**

| | |
|---|---|
| 54 | 4,336,662 |
| 129 | 4,336,663 |

**CLASS 40**

| | |
|---|---|
| 594 | 4,336,664 |

**CLASS 46**

| | |
|---|---|
| 153 | 4,336,665 |

**CLASS 47**

| | |
|---|---|
| 48.5 | 4,336,666 |
| 58 | 4,336,667 |
| | 4,336,668 |
| 74 | 4,336,669 |

**CLASS 48**

| | |
|---|---|
| 63 | 4,337,066 |
| 202 | 4,337,067 |

**CLASS 49**

| | |
|---|---|
| 409 | 4,336,670 |

**CLASS 51**

| | |
|---|---|
| 424 | 4,336,671 |
| 432 | 4,336,672 |

**CLASS 52**

| | |
|---|---|
| 27 | 4,336,673 |
| 169.6 | 4,336,674 |
| 267 | 4,336,675 |
| 309.7 | 4,336,676 |
| 479 | Re.30,980 |
| 584 | 4,336,677 |
| 729 | 4,336,678 |

**CLASS 53**

| | |
|---|---|
| 389 | 4,336,680 |
| 399 | 4,336,679 |
| 459 | 4,336,681 |

**CLASS 55**

| | |
|---|---|
| 1 | 4,337,068 |
| 229 | 4,337,069 |

**CLASS 56**

| | |
|---|---|
| 330 | 4,336,682 |

**CLASS 57**

| | |
|---|---|
| 18 | 4,336,683 |
| 93 | 4,336,684 |
| 238 | 4,336,685 |

**CLASS 60**

| | |
|---|---|
| 39.63 | 4,336,686 |
| 384 | 4,336,687 |
| 602 | 4,336,688 |

**CLASS 62**

| | |
|---|---|
| 18 | 4,337,070 |
| 37 | 4,337,071 |
| 42 | 4,337,072 |
| 55 | 4,336,689 |
| 55.5 | 4,336,690 |
| 64 | 4,336,691 |
| 82 | 4,336,692 |
| 116 | 4,336,693 |
| 374 | 4,336,694 |
| 504 | 4,336,695 |

**CLASS 65**

| | |
|---|---|
| 1 | 4,337,073 |
| 5 | 4,337,074 |
| 12 | 4,337,075 |
| 29 | 4,337,076 |

**CLASS 66**

| | |
|---|---|
| 148 | 4,336,697 |

**CLASS 70**

| | |
|---|---|
| 231 | 4,336,698 |
| 290 | 4,336,699 |
| 366 | 4,336,700 |
| 395 | 4,336,701 |

**CLASS 71**

| | |
|---|---|
| 9 | 4,337,077 |
| 24 | 4,337,078 |
| 34 | 4,337,079 |
| 88 | 4,337,080 |
| 90 | 4,337,081 |
| 93 | 4,337,082 |

**CLASS 72**

| | |
|---|---|
| 75 | 4,336,702 |
| 104 | 4,336,703 |
| 324 | 4,336,704 |
| 457 | 4,336,705 |
| 479 | 4,336,706 |

**CLASS 73**

| | |
|---|---|
| 35 | 4,336,707 |
| 40.5 R | 4,336,708 |
| 61.2 | 4,336,709 |
| 79 | 4,336,710 |
| 162 | 4,336,711 |
| 462 | 4,336,715 |
| 480 | 4,336,716 |
| 487 | 4,336,717 |
| 517 B | 4,336,718 |
| 861.27 | 4,336,719 |
| 862.53 | 4,336,720 |
| 863.11 | 4,336,721 |
| 863.12 | 4,336,722 |

**CLASS 74**

| | |
|---|---|
| 44 | 4,336,723 |
| 193 | Re.30,981 |
| 750 R | 4,336,724 |

**CLASS 75**

| | |
|---|---|
| 5 | 4,337,083 |
| 36 | 4,337,084 |
| 69 | 4,337,086 |
| 83 R | 4,337,085 |
| 124 | 4,337,087 |
| 128 A | 4,337,088 |

**CLASS 76**

| | |
|---|---|
| 25 A | 4,336,726 |
| 25 R | 4,336,725 |

**CLASS 81**

| | |
|---|---|
| 57.39 | 4,336,727 |
| 62 | 4,336,728 |
| 439 | 4,336,729 |

**CLASS 82**

| | |
|---|---|
| 4 A | 4,336,730 |

**CLASS 83**

| | |
|---|---|
| 74 | 4,336,731 |
| 109 | 4,336,732 |
| 477.2 | 4,336,733 |

**CLASS 84**

| | |
|---|---|
| 1.01 | 4,336,734 |
| 1.17 | 4,336,735 |
| 1.19 | Re.30,982 |
| 1.26 | 4,336,736 |
| 151 | 4,336,737 |
| 390 | 4,326,738 |

**CLASS 86**

| | |
|---|---|
| 43 | 4,336,739 |

**CLASS 89**

| | |
|---|---|
| 1.806 | 4,336,740 |
| 7 | 4,336,741 |
| 34 | 4,336,742 |
| 37 B | 4,336,743 |
| 40 K | 4,336,744 |

**CLASS 91**

| | |
|---|---|
| 35 | 4,336,745 |

**CLASS 92**

| | |
|---|---|
| 43 | 4,336,747 |
| 130 B | 4,336,746 |

**CLASS 98**

| | |
|---|---|
| 33 A | 4,336,748 |
| 43 R | 4,336,749 |

**CLASS 100**

| | |
|---|---|
| 88 | 4,336,750 |

**CLASS 101**

| | |
|---|---|
| 93.04 | 4,336,751 |
| 99 | 4,336,752 |
| 127 | 4,336,753 |
| | 4,336,754 |
| 248 | 4,336,755 |

**CLASS 102**

| | |
|---|---|
| 516 | 4,336,756 |

**CLASS 104**

| | |
|---|---|
| 102 | 4,336,757 |

**CLASS 105**

| | |
|---|---|
| 4 R | 4,336,758 |

**CLASS 106**

| | |
|---|---|
| 1.23 | 4,337,091 |
| 14.05 | 4,337,092 |
| 18.33 | 4,337,093 |
| 90 | 4,337,094 |
| 203 | 4,337,095 |

**CLASS 108**

| | |
|---|---|
| 144 | 4,336,759 |

**CLASS 111**

| | |
|---|---|
| 11 | 4,336,760 |

**CLASS 112**

| | |
|---|---|
| 121.12 | 4,336,761 |
| 158 E | 4,336,762 |

**CLASS 114**

| | |
|---|---|
| 74 A | 4,336,764 |
| 74 R | 4,336,763 |

**CLASS 118**

| | |
|---|---|
| 50 | 4,336,765 |
| 60 | 4,336,766 |
| 264 | 4,336,767 |

**CLASS 119**

| | |
|---|---|
| 155 | 4,336,768 |

**CLASS 122**

| | |
|---|---|
| 4 D | 4,336,769 |
| 266 | 4,336,770 |

**CLASS 123**

| | |
|---|---|
| 23 | 4,336,771 |
| 25 B | 4,336,773 |
| 25 L | 4,336,772 |
| 143 B | 4,336,774 |
| 198 F | 4,336,775 |
| 306 | 4,336,776 |
| | 4,336,777 |
| 334 | 4,336,778 |
| 339 | 4,336,779 |
| 438 | 4,336,780 |
| 467 | 4,336,781 |
| 494 | 4,336,782 |
| 557 | 4,336,783 |
| 571 | 4,336,784 |
| 605 | 4,336,785 |

**CLASS 124**

| | |
|---|---|
| 23 R | 4,336,786 |
| 69 | 4,336,787 |

**CLASS 126**

| | |
|---|---|
| 8 | 4,336,788 |
| 21 A | 4,336,789 |
| 58 | 4,336,790 |
| 110 R | 4,336,791 |
| 420 | 4,336,792 |
| 450 | 4,336,793 |

**CLASS 128**

| | |
|---|---|
| 4 | 4,336,794 |
| 80 A | 4,336,795 |
| 87 R | 4,336,796 |
| 132 D | 4,336,797 |
| 200.14 | 4,336,798 |
| 201.24 | 4,336,799 |
| 214 F | 4,336,800 |
| 239 | 4,336,801 |
| 272 | 4,336,802 |
| 287 | 4,336,803 |
| 290 R | 4,336,804 |
| 310 | 4,336,805 |
| 348 | 4,336,806 |
| 379 | 4,336,807 |
| 663 | 4,336,808 |
| 665 | 4,336,809 |
| 702 | 4,336,810 |
| 784 | 4,336,811 |

**CLASS 131**

| | |
|---|---|
| 84 C | 4,336,813 |
| 84 R | 4,336,812 |
| 291 | 4,336,814 |

**CLASS 132**

| | |
|---|---|
| 143 | 4,336,815 |

**CLASS 134**

| | |
|---|---|
| 8 | 4,337,096 |
| 110 | 4,336,816 |

**CLASS 135**

| | |
|---|---|
| 16 | 4,336,817 |

**CLASS 137**

| | |
|---|---|
| 38 | 4,336,818 |
| 85 | 4,336,819 |
| 100 | 4,336,820 |
| 187 | 4,336,821 |
| 268 | 4,336,822 |
| 270 | 4,336,823 |
| 315 | 4,336,824 |
| 403 | 4,336,825 |
| 540 | 4,336,826 |
| 624.27 | 4,336,827 |

**CLASS 138**

| | |
|---|---|
| 118.1 | 4,336,828 |

**CLASS 139**

| | |
|---|---|
| 76 | 4,336,829 |

**CLASS 141**

| | |
|---|---|
| 59 | 4,336,830 |

**CLASS 144**

| | |
|---|---|
| 2 R | 4,336,831 |

**CLASS 145**

| | |
|---|---|
| 29 R | 4,336,832 |

**CLASS 148**

| | |
|---|---|
| 6.15 R | 4,337,097 |
| 9 R | 4,337,098 |
| 9.5 | 4,337,099 |
| 31.55 | 4,337,100 |
| 111 | 4,337,101 |
| 402 | 4,337,090 |

**CLASS 149**

| | |
|---|---|
| 19.3 | 4,337,102 |
| 19.9 | 4,337,103 |

**CLASS 152**

| | |
|---|---|
| 353 G | 4,336,833 |

**CLASS 156**

| | |
|---|---|
| 69 | 4,337,104 |
| 87 | 4,337,105 |
| 228 | 4,337,106 |
| 249 | 4,337,107 |
| 285 | 4,337,108 |
| 293 | 4,337,109 |
| 307.4 | 4,337,110 |
| 307.5 | 4,337,111 |
| 351 | 4,337,112 |
| 353 | 4,337,113 |
| 656 | 4,337,114 |
| 659.1 | 4,337,115 |

**CLASS 160**

| | |
|---|---|
| 168 A | 4,336,834 |

**CLASS 162**

| | |
|---|---|
| 158 | 4,337,116 |
| 161 | 4,337,117 |
| 164.3 | 4,336,835 |

**CLASS 165**

| | |
|---|---|
| 47 | 4,336,836 |
| 104.22 | 4,336,837 |
| 109 T | 4,336,838 |

**CLASS 166**

| | |
|---|---|
| 59 | 4,336,839 |
| 77 | 4,336,840 |
| 216 | 4,336,841 |
| 276 | 4,336,842 |
| 362 | 4,336,843 |

**CLASS 172**

| | |
|---|---|
| 140 | 4,336,844 |
| 349 | 4,336,845 |
| 776 | 4,336,846 |

**CLASS 173**

| | |
|---|---|
| 118 | 4,336,847 |
| 139 | 4,336,848 |

**CLASS 174**

| | |
|---|---|
| 138 F | 4,337,374 |

**CLASS 175**

| | |
|---|---|
| 246 | 4,336,849 |
| 393 | 4,336,850 |

**CLASS 177**

| | |
|---|---|
| 16 | 4,336,851 |
| 25 | 4,336,852 |
| | 4,336,853 |
| 210 R | 4,336,854 |
| 245 | 4,336,855 |

**CLASS 179**

| | |
|---|---|
| 1 SA | 4,337,375 |
| 2 EB | 4,337,376 |
| 2 R | 4,337,377 |
| 18 FA | 4,337,378 |
| 115.5 PV | 4,337,379 |
| 146 E | 4,337,380 |
| 178 | 4,337,381 |

**CLASS 180**

| | |
|---|---|
| 165 | 4,336,856 |
| 177 | 4,336,857 |
| 179 | 4,336,858 |
| 226 | 4,336,859 |
| 273 | 4,336,860 |

**CLASS 181**

| | |
|---|---|
| 144 | 4,336,861 |
| 200 | 4,336,862 |
| 224 | 4,336,863 |
| 241 | 4,336,864 |

**CLASS 184**

| | |
|---|---|
| 14 | 4,336,865 |
| 15 R | 4,336,866 |

**CLASS 188**

| | |
|---|---|
| 326 | 4,336,867 |
| 376 | 4,336,868 |

**CLASS 192**

| | |
|---|---|
| 13 R | 4,336,869 |
| 105 CF | 4,336,870 |
| 107 C | 4,336,871 |

**CLASS 193**

| | |
|---|---|
| 2 R | 4,336,872 |

**CLASS 196**

| | |
|---|---|
| 46 | 4,337,119 |
| 125 | 4,337,120 |

**CLASS 198**

| | |
|---|---|
| 347 | 4,336,873 |
| 458 | 4,336,874 |
| 486 | 4,336,875 |
| 509 | 4,336,876 |
| | 4,336,877 |

**CLASS 200**

| | |
|---|---|
| 5 E | 4,337,382 |
| 51.09 | 4,337,383 |

**CLASS 202**

| | |
|---|---|
| 169 | 4,337,121 |
| 248 | 4,337,122 |

**CLASS 203**

| | |
|---|---|
| 19 | 4,337,123 |

**CLASS 204**

| | |
|---|---|
| 2.1 | 4,337,124 |
| 59 R | 4,337,125 |
| 98 | 4,337,126 |
| | 4,337,127 |
| 107 | 4,337,128 |
| 151 | 4,337,129 |
| 159.15 | 4,337,130 |
| 180 G | 4,337,131 |
| 192 C | 4,337,133 |
| 192 E | 4,337,132 |
| 198 | 4,337,134 |
| 213 | 4,337,135 |
| 242 | 4,337,136 |
| 252 | 4,337,137 |
| 290 R | 4,337,138 |
| 292 | 4,337,139 |
| | 4,337,140 |
| 301 | 4,337,141 |

**CLASS 206**

| | |
|---|---|
| 173 | 4,336,878 |
| 323 | 4,336,879 |
| 524.4 | 4,336,880 |
| 525 | 4,336,881 |
| 537 | 4,336,882 |
| 545 | 4,336,883 |
| 575 | 4,336,884 |

**CLASS 208**

| | |
|---|---|
| 8 LE | 4,337,142 |
| | 4,337,148 |
| 11 R | 4,337,143 |
| 120 | 4,337,144 |
| | 4,337,145 |
| 139 | 4,337,146 |

206 4,337,147

**CLASS 209**

166 4,337,149
237 4,337,150

**CLASS 210**

139 4,337,151
197 4,337,152
288 4,337,153
490 4,337,154
500.1 4,337,155
672 4,337,156
691 4,337,157
785 4,337,158

**CLASS 211**

4 4,336,885
13 4,336,886
4,336,887
45 4,336,888

**CLASS 212**

178 4,336,889

**CLASS 215**

272 4,336,890
276 4,336,891

**CLASS 219**

10.55 B 4,337,384
69 V 4,337,385
130.21 4,337,386
160 4,337,387
309 4,337,388
511 4,337,389
532 4,337,390

**CLASS 221**

125 4,336,892
171 4,336,893
280 4,336,894

**CLASS 222**

207 4,336,895
504 4,336,896

**CLASS 224**

42.03 B 4,336,897
202 4,336,899

**CLASS 226**

97 4,336,900
173 4,336,901

**CLASS 235**

70 A 4,337,391
92 DN 4,337,392
92 T Re.30,986
487 4,337,393

**CLASS 236**

46 R 4,336,902
92 R 4,336,903
4,336,904

**CLASS 237**

8 R 4,336,905

**CLASS 238**

8 4,336,906

**CLASS 239**

57 4,336,907
177 4,336,908
381 4,336,909

**CLASS 241**

246 4,336,910

**CLASS 242**

46.4 4,336,912
75.4 4,336,911

**CLASS 244**

45 R 4,336,913
46 4,336,914
153 R 4,336,915

**CLASS 248**

471 4,336,916
550 4,336,917

**CLASS 250**

237 G 4,337,394
332 4,337,395
340 4,337,396
363 S 4,337,397
548 4,337,398

**CLASS 251**

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214 4,336,919
357 4,336,920

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105 4,337,165
174.15 4,337,166
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373 4,337,170
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404.5 4,337,207
414 4,337,208
417 4,337,209
439 R 4,337,210
456 F 4,337,211
463 4,337,212
502 R 4,337,213
502.5 4,337,214
513 N 4,337,215

**CLASS 261**

112 4,337,216
4,337,217

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3 R 4,337,218
25 4,337,220
102 4,337,221
130 4,337,219

**CLASS 266**

51 4,336,923
117 4,336,924
193 4,336,925
227 4,336,922

**CLASS 269**

34 4,336,926
171.5 4,336,927

**CLASS 271**

3.1 4,336,928
20 4,336,929
277 4,336,930

**CLASS 272**

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4 4,336,932
70 4,336,933
72 4,336,934

**CLASS 273**

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51 4,336,937
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411 4,336,942

**CLASS 277**

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625 4,336,956
803 4,336,957
824 4,336,949

**CLASS 285**

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368 4,336,959

**CLASS 289**

17 4,336,960

**CLASS 290**

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254 4,336,961

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87.28 4,336,898
106 4,336,962

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78 R 4,336,964

**CLASS 297**

435 4,336,965

**CLASS 299**

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**CLASS 307**

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39 4,337,401
121 4,337,402
221 D 4,337,403
252 L 4,337,404

**CLASS 308**

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61 4,336,969
79 R 4,336,970
187.2 4,336,971
233 4,336,972

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249 4,337,407

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383 4,337,422

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**CLASS 324**

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379 4,337,432

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114 4,337,434
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157 4,337,436

**CLASS 330**

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10 4,337,438
54 4,337,439
129 4,337,440
261 4,337,441

**CLASS 332**

31 T 4,337,444

**CLASS 333**

14 4,337,445
238 4,337,446

**CLASS 335**

167 4,337,447
210 4,337,448
225 4,337,449

**CLASS 337**

66 4,337,450
93 4,337,451

231 4,337,452

**CLASS 338**

320 4,337,453

**CLASS 339**

8 R 4,336,974
28 4,336,975

**CLASS 340**

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146.3 AG 4,337,455
347 DA 4,337,459
347 DD 4,337,457
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347 NT 4,337,456
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753 4,337,464
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825.3 4,337,463
870.09 4,337,466

**CLASS 346**

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75 4,337,469
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140 R 4,337,471
155 4,337,472

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286 4,336,991

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90 4,337,488
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72 4,337,503
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125 4,337,505
142 4,337,506

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**CLASS 364**

200 4,337,510
426 4,337,511
431.09 4,337,512
431.11 4,337,513
515 4,337,514
551 4,337,515
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571 4,337,517
724 4,337,518
736 4,337,519

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6 4,337,520
33 4,337,521
190 4,337,522
194 4,337,523
229 4,337,524
233 4,337,525
238 4,337,526

**CLASS 366**

101 4,336,999
288 4,337,000

**CLASS 367**

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136 4,337,528

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49 4,337,443

**CLASS 374**

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197 4,336,713

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210 4,337,118

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209 4,337,004

**CLASS 404**

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**CLASS 405**

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199 4,337,011

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67 4,337,012

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240 4,337,013
332 4,337,014
686 4,337,015

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116 4,337,016

**CLASS 417**

516 4,337,017

**CLASS 418**

132 4,337,018

**CLASS 420**

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112 4,337,223
197 4,337,224

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114 4,337,228
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362 4,337,232
397 4,337,233
424 4,337,234
468 4,337,235
474 4,337,236
486 4,337,237
555 4,337,238
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59 4,337,241
89 4,337,242
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131 4,337,245
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177 4,337,247
180 4,337,248
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246 4,337,251
248.57 4,337,250
4,337,252
250 4,337,253
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263 4,337,257
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273 P 4,337,263
273 R 4,337,262
274 4,337,264
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116 4,337,019
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237 4,337,023
363 4,337,024
392 4,337,025
454 4,337,026
562 4,337,027

**CLASS 426**

104 4,337,275
124 4,337,276
534 4,337,277
583 4,337,278

**CLASS 427**

40 4,337,279
150 4,337,280
236 4,337,281
421 4,337,282

**CLASS 428**

17 4,337,283
35 4,337,284
4,337,285
36 4,337,286
133 4,337,287
141 4,337,292
172 4,337,288
195 4,337,289
201 4,337,290
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297 Re.30,984
337 4,337,293
407 4,337,294
410 4,337,295
420 4,337,296
461 4,337,297
4,337,298
562 4,337,299
627 4,337,300

**CLASS 429**

179 4,337,301
181 4,337,302

**CLASS 430**

11 4,337,303
24 4,337,304
82 4,337,305
122 4,337,306
157 4,337,307

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| 306 | 4,337,308 |
| **CLASS 431** | |
| 7 | 4,337,028 |
| 264 | 4,337,029 |
| **CLASS 432** | |
| 14 | 4,337,030 |
| 98 | 4,337,031 |
| 106 | 4,337,032 |
| 197 | 4,337,033 |
| 234 | 4,337,034 |
| 246 | 4,337,035 |
| **CLASS 433** | |
| 5 | 4,337,036 |
| 8 | 4,337,037 |
| 32 | 4,337,038 |
| 60 | 4,337,039 |
| 80 | 4,337,040 |
| 149 | 4,337,041 |
| 171 | 4,337,042 |
| 225 | 4,337,043 |
| **CLASS 434** | |
| 11 | 4,337,044 |
| 29 | 4,337,045 |
| 103 | 4,337,046 |
| 201 | 4,337,047 |
| 219 | 4,337,048 |
| 247 | 4,337,049 |
| 260 | 4,337,050 |
| 328 | 4,337,051 |
| **CLASS 435** | |
| 22 | 4,337,309 |
| | 4,337,310 |
| 54 | 4,337,311 |
| 78 | 4,337,312 |
| 177 | 4,337,313 |
| 240 | Re.30,985 |
| 253 | 4,337,314 |
| 313 | 4,337,315 |
| **CLASS 440** | |
| 9 | 4,337,052 |
| 87 | 4,337,053 |
| 89 | 4,337,054 |
| **CLASS 464** | |
| 111 | 4,336,696 |
| **CLASS 474** | |
| | 4,337,055 |
| 153 | 4,337,056 |
| 242 | 4,337,057 |
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| 11 | 4,337,058 |
| 184 | 4,337,059 |
| **CLASS 501** | |
| 21 | 4,337,316 |
| 142 | 4,337,317 |
| **CLASS 521** | |
| 80 | 4,337,318 |
| 96 | 4,337,319 |
| 137 | 4,337,320 |
| 143 | 4,337,321 |
| **CLASS 523** | |
| 128 | 4,337,181 |
| 166 | 4,337,322 |
| 212 | 4,337,192 |
| 332 | 4,337,189 |
| **CLASS 524** | |
| 140 | 4,337,188 |
| 239 | 4,337,323 |
| 446 | 4,337,183 |
| 458 | 4,337,185 |
| 504 | 4,337,187 |
| 599 | 4,337,190 |
| | 4,337,191 |
| 609 | 4,337,182 |
| 726 | 4,337,184 |
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| 72 | 4,337,324 |
| 205 | 4,337,325 |
| 244 | 4,337,326 |
| 280 | 4,337,327 |
| 336 | 4,337,328 |
| 339 | 4,337,329 |
| 362 | 4,337,186 |
| 407 | 4,337,330 |
| 429 | 4,337,331 |
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| 15 | 4,337,332 |
| 67 | 4,337,333 |
| 137 | 4,337,334 |
| **CLASS 536** | |
| 13.6 | 4,337,335 |
| 13.8 | 4,337,336 |
| **CLASS 542** | |
| 426 | 4,337,337 |
| | 4,337,338 |
| **CLASS 544** | |
| 257 | 4,337,339 |
| 350 | 4,337,340 |
| **CLASS 546** | |
| 112 | 4,337,341 |
| 251 | 4,337,342 |
| **CLASS 548** | |
| 152 | 4,337,343 |
| 158 | 4,337,344 |
| 242 | 4,337,345 |
| 324 | 4,337,346 |
| 413 | 4,337,201 |
| 451 | 4,337,200 |
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| 16 | 4,337,347 |
| 314 | 4,337,202 |
| 396 | 4,337,203 |
| 465 | 4,337,204 |
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| 436 | 4,337,348 |
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| 174 | 4,337,350 |
| 263 | 4,337,351 |
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| 401 | 4,337,352 |
| 460 | 4,337,353 |
| 461 | 4,337,354 |
| 478 | 4,337,355 |
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| 154 | 4,337,357 |
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| 322 | 4,337,360 |
| 386 | 4,337,361 |
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| 487 | 4,337,365 |
| 698 | 4,337,366 |
| 720 | 4,337,367 |
| 730 | 4,337,368 |
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| | 97 | 265,161 |
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| D19— | 35 | 265,211 |
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| | 35 | 265,217 |
| | 66 | 265,218 |
| | 78 | 265,219 |
| | 118 | 265,220 |
| | 147 | 265,221 |
| | 226 | 265,222 |
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| | | 265,224 |
| D22— | 20 | 265,225 |
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(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

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